

CDM CPA Validation Report

AFRICAN IMPROVED COOKING STOVES PROGRAMME OF ACTIVITIES – CPA No. 00001 (GHANA)

GLC Report No: 223-CPA1, Rev. 11

Validation Report

African Improved Cooking Stoves Programme of Activities – CPA No.

00001 (Ghana)

GLC Report No. 223-CPA1, Rev. 11



Organisational Unit		
Germanischer Lloyd Certification GmbH (GLC), Greenhouse Gas Services		
Client	Client reference person	
Envirofit International Ltd	Randall Monson	
Summary:		
PoA-DD:	African Improved Cooking Stoves Programme of Activities	
Generic CPA-DD:	African Improved Cooking Stoves Programme of Activities – CPA No. ##### (state country in which the CPA takes place)	
Specific case CPA-DD:	African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)	
Project Host Country(ies):	Ghana	
Coordinating / Managing Entity (CME):	Envirofit International Ltd	
Entity/individual responsible for the CPA:	Centre for Energy, Environment and Sustainable Development (CEESD)	
Sectoral Scope(s), Technical Area(s)	CDM Sectoral Scope 3, Technical Area 3.1.	
Methodology(ies) / Version(s):	AMS-II.G / version 03	
Project Size:	<input type="checkbox"/> Large Scale	<input checked="" type="checkbox"/> Small Scale ¹
ER Estimation of the CPA:	154,770 tCO ₂ e total	15,477 tCO ₂ e per year
Start date of the PoA crediting period:	15-12-2012 (or on the date of registration, whichever is later)	
PoA Duration:	28 years	
Starting date of CPA crediting period:	15-12-2012 (or date of registration, whichever is later)	
CPA Crediting Period:	<input checked="" type="checkbox"/> Fixed (10 years)	<input type="checkbox"/> Renewable (7years)
GSC date of the PoA:	13-12-2011	
CPA start date:	03-01-2012	
Validation opinion:	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
Project Assessment Team:	Technical Review Team:	Final Approval:
Karunakar Avuram Cyprian Fusi	Fernando Rangel Villasana Georg Zenk	Markus Weber
Date of this revision:	Revision No.	Number of pages

¹ This CPA fulfills the micro-scale threshold and additionality criteria

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History of report revisions:

Rev.	Date	Person (short sign or name)	Function	Action
01	2012-05-15	Cyprian Fusi	TA	Draft report
02	2012-05-18	Karunakar Avuram	ATL + Technical expert	Technical expert inputs to draft report
03	2012-06-13	Cyprian Fusi	TA	Revision es per expert input
04	2012-06-29	Karunakar Avuram	ATL + Technical expert	Completion of draft report
05	2012-07-07	Fernando Rangel Villasana	Technical Reviewer	Review with revisions and comments
06	2012-07-12	Cyprian Fusi	TA	Revision as per TR input
07	2012-07-29	Georg Zenk	Technical Expert	Review with revisions and comments
08	2012-08-24	Cyprian Fusi	TA	Revision as per TE input
09	2012-08-29	Markus Weber	Final Review and Approver	Final review and approved
10	2012-12-03	Cyprian Fusi	TA	Revision as per Incomplete
11	2012-12-05	Markus Weber	Final Review and Approver	Final review and approved

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Abbreviations

ACM	Approved Consolidated Methodology
AM	Approved Methodology
AMS	Approved Methodology Small scale
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board (the board)
CER	Certified Emission Reduction
CL/CR	Clarification Request
CME	Coordinating and Managing Entity
CMP	Meeting of the Parties to the Kyoto Protocol
CO ₂	Carbon dioxide
CO ₂ e / CO ₂ eq	Carbon dioxide equivalent
COP/MOP	The Conference of the Parties to the United Nations Framework Convention on Climate Change serving as the Meeting of the Parties to the Kyoto Protocol
CPA	Component Project Activity
CPA-DD	CDM Project Activity Design Document
DNA	Designated National Authority
DO	Distributing Organisation
DOE	Designated Operation Entity
EIA	Environmental Impact Assessment
EF	Emission Factor
FAO	Food and Agriculture Organization
FAR	Forward Action Request
GSC	Global Stakeholder Consultation
GHG	Greenhouse gas
GLC	Germanischer Lloyd Certification GmbH
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
LoA	Letter of Approval
NGO	Non-governmental Organisation
NRB	Non-Renewable Biomass
ODA	Official development assistance
O&M	Operation and maintenance
PDD	Project Design Document
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant (s)
SSC	Small Scale CDM
SME	Small and Medium size Enterprises
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual
WHO	World Health Organisation

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1 INTRODUCTION

Envirofit International Ltd has commissioned Germanischer Lloyd Certification GmbH (GLC) to perform the validation of the African **Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)** (hereafter called “the CPA”) to be included under the PoA **African Improved Cooking Stoves Programme of Activities**.

This validation report summarizes the findings of the validation of the CPA, performed on the basis of UNFCCC criteria for the CDM and the CPA inclusion eligibility criteria set up in the PoA, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions made by COP/MOP and the CDM Executive Board.

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the CPA's baseline, monitoring plan, and the CPA's compliance with relevant UNFCCC and host Party criteria are validated by a Designated Operational Entity (DOE) in order to confirm that the CPA design as documented in the following documents:

- PoA Project Design Document (PoA-DD),
- CDM Project Activity Design Document generic (CPA-DD generic) and
- CPA-DD real case

is sound and reasonable and that it meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Certified Emission Reductions (CERs). The executing DOE can only provide a validation opinion but the ultimate decision whether a project is registered or not rests with the CDM Executive Board (CDM-EB).

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the real case CPA-DD against the registered or final PoA-DD and generic CPA-DD and supporting documentation. The CPA-DD and supporting documentation are reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved consolidated baseline and monitoring methodology AMS-II.G, (version 03). The validation was based on the recommendations and guidance of the [Validation and Verification Manual](#), VVM version 1.2^{6/} and all PoA related CDM requirements.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the CPA design.

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2 VALIDATION TEAM

2.1 Assessment Team

A competent team with relevant knowledge and experience in the specific scopes and sectors was appointed by GLC. The appointment of the team takes into account the required scope, technical area, knowledge of the host country and general project activity knowledge requirements for validating the CPA design and the relevant CERs will be achieved by the CPA under the PoA. The appointment of the audit team also includes a screening of everyone involved against any conflict of interest. The assessment team is composed of an Assessment Team Leader (ATL), Auditors (A) and Host Country or Technology Expert (E). Table 2-1 below shows the composition of the assessment team their qualifications and/or functions.

Table 2-1: Validation team members, qualification and knowledge

Name (Family Name, First Name)	Function ¹⁾	Sectoral scope specific knowledge	Technical area specific knowledge	Local knowledge	Type of involvement				
					Desk review	On-site visit / interviews	Reporting	Supervision of work	Expert input
Avuram, Karunakar	ATL + TE	X	X		X	X		X	X
Fusi, Cyprian	TA			X	X	X	X		

1) ATL: Assessment Team Leader; A: Auditor; TE: Technical Expert;

2.2 Technical Review and Final Approval Team

Before submission of the final Validation / Inclusion Report to EB of the UNFCCC, a technical review of the whole validation procedure and the draft report was carried out by GLC appointed Technical Reviewer (TR) team. The appointed TR team is composed of competent GHG auditors for the sectoral scope and technical area under which this CPA falls. Each involved reviewer is not directly involved in the validation assessment up to the start of the internal technical review phase of this CPA.

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As a result of the internal technical review process, the validation opinion and the topic specific assessments as prepared by the validation's ATL may be confirmed or revised. Furthermore, reporting improvements might be achieved.

Finally, the CPA-PDD (real case), validation / inclusion report and any document to be submitted to the EB have to undergo an internal quality control and completeness check before they are approved to be included under the PoA and uploaded to UNFCCC website. The Technical Review team and the person responsible for approval of the report are found in the table below.

Table 2-2: Technical Review and Approval Team.

Name (Family name, given name)	Qualification / Function ²⁾	Technical Area Knowledge	Sectoral Scope Expertise	Type of Involvement	
				Review	Approval
Villasana, Fernando	R			X	
Zenk, Georg	TE	X	X	X	
Weber, Markus	FR+FA				X

2) T: Trainee, R: Reviewer, TE: Technical Expert, FR: Final Reviewer, FA: Final Approval.

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3 METHODOLOGY

The validation consists of the following three phases:

- I. Desk review of the CPA-DD specific case against the registered or final PoA-DD, CPA-DD generic^{1/}, and other supporting documents. This includes the preliminary compliance check of the CPA design against the applicability conditions and with regard to baseline setting and eligible project measures, monitoring of emission reductions, as well as completeness and correctness of the CPA compliance towards the Eligibility Criteria (EC) for the Inclusion of a CPA under the PoA.
- II. On-site assessment and follow-up interviews (through email communications, telephone calls, skype, inter alia) with project participants and stakeholders as deemed necessary
- III. Resolution of outstanding issues and the issuance of the draft validation report and opinion
- IV. Technical review of the draft validation report and other supporting documentation in order to ensure the correctness, completeness and depth of the reporting.
- V. Finally the report and supporting documentation has to be approved by a competent person before they are submitted to CDM-EB for request for inclusion under the registered PoA.

This final validation report summarizes the findings after all phases of the validation process have been completed. The following sections outline each step in a more detailed way.

3.1 Desk Review of the CPA-DD and Supporting Documents

The initial version of the CPA-PDD generic and CPA-DD specific case of Ghana as well as other supporting background documents related to the project design and baseline submitted by the PP, were initially assessed in the context of a desk-review in order to verify the correctness, credibility and interpretation of the presented information. A further crosscheck of the information provided was done with information from other sources as available. Preliminary findings from the desk review were sent to the PPs together with the audit plan to prepare for the subsequent on-site visit as deemed necessary.

Desk review is based on the first version of the PoA-DD, CPA-DD generic and CPA-DD specific case which were uploaded to launch the Global Stakeholder Consultation (GSC) on 13th December 2011.

A complete list of documentation reviewed during the validation process is presented as Information Reference in section 6.

3.2 On-Site Assessment and Follow-Up Interviews with Project Stakeholders

From January 25, 2012 to January 28, 2012, members of the assessment team as appointed by GLC conducted an on-site audit in Ghana where the 1st CPA will be implemented. The following site(s) was / were visited:

- Kumasi where the implementation of the 1st CPA will start;

Germanischer Lloyd Certification Code: DC-GHG 015_A, Rev.00 Date: 2012-02-24; MN, Cyf, Junw	Page 11
Attention: This form is controlled electronically and shall only be printed out for using as a record	

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- Office of the CPA Implementer, [Centre for Energy, Environment and Sustainable Development \(CEESD\)](#) in Kumasi
- Local Council in Kumasi
- Office of the Ghanaian DNA in Accra
- Ministry of Energy in Accra

In the context of such on-site visits, GLC performed interviews with the relevant stakeholders and potential end users of ICS and also an assessment of project related documents provided by the project participants. The members of the validation team also conducted interviews with representatives of government (Officials from the Ministry of Energy and DNA) in order to confirm selected information and to resolve issues earlier identified during the desk review of documents. The main topics addressed during the interviews includes, inter alia:

- Programme overview
- CPA design and adopted technology
- Demonstration of baseline and additionality
- Project implementation timeline and any risk of delay
- GHG emission reduction calculations
- Application of the monitoring methodology as well as expected design and application of the monitoring and managing plan
- Local Stakeholder Consultation process
- Assessment of environmental impacts, environmental licensing and legal compliance of the project and baseline scenario with applicable regional and national legislation.
- Calculation of Fraction of Non-Renewable Biomass (f_{NRB})
- Letter(s) of Approval(s) by the respective countries' DNA

The names of those interviewed during the validation process are listed below in Table 3-1.

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Table 3-1: Interviewed Persons

Name		Position / Organization
1	Killian Wentrup	CDM Consultant, Perspectives Climate Change GmbH
2	Ronnie Twesigye	South Pole Carbon Assets Management
3	Nathan Lorenz	Vice President Engineering, Envirofit International Ltd
4	Edward Antwi	CEESD
5	Edem Bensah	CEESD
6	Peter Dery	DNA / Ministry of Environment, Science and Technology
7	Kyekyeku Yaw Oppong-Boadi	UNFCCC Focal Point, Ghana
8	Gifty Tettey	Ministry of Energy, Ghana
9	Owusu Frempong-Boadu	Municipal Coordinating Director, Kumasi
10	Christian Owusu-Ansah	Deputy Municipal Coordinating Director, Kumasi
11	Asiedu Zipporah	CEESD
12	Joseph X.F. Ribeiro	CEESD
13	Julius C. Ahiekpor	CEESD
14	Dampfey Kofi Nyame	CEESD
15	Ernest Appan	CEESD
16	Obed Kofi Asamoah	CEESD
In addition to the above interviewed persons, 24 Would-be End Users of ICS were interviewed in the 1 st CPA area in Kumasi in order to confirm the baseline (signed participation list is available and would be provided if requested).		

3.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to GLC's final conclusion on the CPA design as described in the CPA-DD and supporting documentation. In order to ensure transparency, a validation questionnaire was customised for the CPA, according to the latest version of the applied methodology ([AMS-II.G version 03^{2/}](#)) and [Validation and Verification Manual](#) (VVM)^{6/} and PoA related CDM requirements according to EB 55 Annex 38 [Procedure for Registration of a PoA as a single Project Activity](#) version 4.1^{27/}, EB 65 Annex 3 and EB 70 Annex 5 [PoA Standard](#)^{3/}. This questionnaire shows in transparent manner VVM requirements, source, means and findings of validation as well as the results from validating the identified criteria. The validation questionnaire serves the following purposes:

- It organises, details and clarifies the requirements a CDM project activity (CPA) is expected to meet;

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- It ensures a transparent validation process where the validators will document how a particular requirement has been validated and the result of the validation.

The validation questionnaire consists of one table with sub-sections. These sections are related to the different topics which have to be validated and checked with respect to the VVM and PoA requirements. The completed validation questionnaire for the **African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)** is enclosed in Annex A to this report. The different columns of this questionnaire are explained in Table 3-2.

Findings established during the validation can either be seen as a non-fulfilment of criteria of the applicable CDM baseline and monitoring methodology, and/or applicable criteria of the CDM or where a risk to the fulfilment of PoA objectives is identified.

Corrective action requests (CAR) are issued, where:

- the project participants have made mistakes that will influence the ability of the CPA to achieve real, measurable additional emission reductions; or
- applicable baseline and monitoring methodology, and/or applicable criteria of the CDM have not been met; or
- there is a risk that emission reductions cannot be monitored or calculated or that the project would not be accepted as CDM project activity

A clarification request (CL) may be used provided information is insufficient or not clear enough to determine whether the applicable CDM PoA requirements have been met or where additional information is needed to fully clarify a particular issue.

The validation questionnaire consists of individual frames for each Corrective action requests (CAR) and clarification request (CL) raised. The content of each frame is described in the figure below. To guarantee the transparency of the validation process, the concerns raised by GLC and the responses provided by the project participants are fully documented in Annex A of this report.

Forward Action Requests (FARs) are issued during validation to highlight issues related to PoA implementation that require review/assessment during the subsequent verification(s) of the PoA. FARs are not related to the CDM requirements for registration.

The findings are separately presented in a findings list table which is also attached in Annex A. The different columns of this list are explained in Table 3-3.

The resolution of all the 6 CARs and 9 CLs raised for this project activity (CPA-DD) is enclosed in Annex A of this Validation Report. The table shows the interaction between the project participants on one hand and GLC audit team on the other hand which resulted in the revision of the final PDD to version 03.1 of 2012-08-29. Upon successful closure of the raised CARs and CLs the assessment team confirms that there are no remaining non-conformities.

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Table 3-2: Structure of the Validation Questionnaire

<i>CHECKLIST QUESTION / VVM and PoA REQUIREMENTS</i>	<i>SOURCE</i>	<i>MEANS AND FINDINGS OF VALIDATION</i>	<i>Assessment based on POA-DD and CPA-DDs in GSP</i>	<i>Conclusion based on Final PoA-DD and CPA-DDs</i>
Lists CDM requirements which the PoA should meet. The checklist is organised in several different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the checklist question or item is from.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR), Clarification request (CL), or Forward Action Request (FAR).	This is either: OK, when the Draft Conclusion is OK or raised CAR/CLs have been successfully closed out; OK, with only FAR remaining; Or: CAR/CLs

Table 3-3: Structure of the Findings List – Resolution of Corrective Action and Clarification Requests

Description of Finding (CAR, CL, FAR) <i>Describe the finding in a transparent manner i.e. state clearly what is required and why; address the context (e.g. section)</i>	Project Participants Response <i>This section shall be filled by the PP. The finding shall be addressed with suitable arguments and evidence</i>	GLC Assessment <i>The assessment shall include how the finding is closed i.e. how it is found that the response is assessed to be appropriate and meeting the specific requirement of the finding. In case the response is not satisfactory, additional response and DOE assessments (#2, #3, etc.) shall be sought.</i>	Final Conclusion (OK Closed Out / Not closed out?)
In this column a finding is described in a clear and transparent manner. It also shall be described which further information is needed or which correction must be applied. The date of issue is also indicated.	In this column the PP shall provide a clear statement how to close the finding. This statement shall be sustained with suitable arguments and evidence. The date of issue is also indicated. In case more rounds are necessary, it shall also be indicated.	In this column GLC shall provide the conclusion of the assessment. The finding can be close here or if the argumentation and/or evidence are not suitable a new line below with the continuation of the finding will be opened. The date of issue is also indicated. In case more rounds are necessary, it shall also be indicated.	GLC indicates whether the issue raised in the finding has been closed out or not by indicating OK for closed out or Not OK for not closed out.

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4 VALIDATION REPORTING

4.1 Coordinating and Managing Entity, CPA implementers and Parties Approval

The project participants listed in tabular form in the final PoA-DD in section A.3 and in annex 1 are

- 1 **Envirofit International Ltd** (incorporated in the USA) and is also the CME of the PoA
- 2 **Centre for Energy, Environment and Sustainable Development** (a Ghana based company) as the CPA implementer

Information regarding the CPA implementer is confirmed as consistent with section A.3 and Annex 1 of the specific case CPA-DD.

No other entry is included in these sections of the PoA-DD.

Envirofit International Ltd has been approved by the UK DNA according to the Letter of Approval^{/58/} issued on 2012-08-17 authorizing [Envirofit International Ltd](#) as the CME and as a project participant. The UK approval could not be double checked with the [List of Approved Projects](#) published by the UK DNA - Environment Agency - since this list was last updated on 2011-12-06, prior to GSC. However, the original email sent to PP with the LoA attached was forwarded to GLC in which Mr. Kevin Sheridan of UK DNA wrote *"I can confirm that we are now in receipt of the required fee and documents for this project, therefore, please find attached letters of approval for said project."* GLC therefore considers the LoA as authentic.

The Ghanaian DNA – [Environmental Protection Agency](#) (EPA) - has also issued a Letter of Approval^{/53/} on May 04, 2012 authorizing [Envirofit International Ltd](#) as the CME of the **African Improved Cooking Stoves Programme of Activities** in Ghana.

Mr. Peter Dery in a reply to our request for confirmation mail wrote *"I on behalf on the DNA issued the said LoA...consider it authentic."*

[Centre for Energy, Environment and Sustainable Development](#) is not an approved PP since according to EB 55 Annex 38 [Procedure for registration of a programme of activities as a single project activity](#) version 4.1^{/27/} *"The operators of individual CPAs are not required to be project participants. CDM programme participation is only recorded at the PoA level."*

GLC received these letters from the project participants directly and after double checking, considers the provided letters to be authentic according to VVM § 49(c).

Furthermore, after checking the LoAs provided, GLC is able to confirm that both letters refer to the same PoA titled **African Improved Cooking Stoves Programme of Activities** and proposed CPA titled **African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)** which is in line with the title in the PDDs.

Both LoAs also indicate that each of the participating Party is a Party to the Kyoto Protocol, and that the participation in the **African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)** project is voluntary. The Ghana LoA also confirms that the proposed CDM project activity contributes to the sustainable development of Ghana (host country). The LoA does not specify a version number of the PDD or of the validation report. However, all other references mentioned in the LoA, PDD and validation report are consistent.

Based on the information given in these letters, GLC considers the approval and the participation of each of the parties as unconditional.

The requirements of the VVM (§§ 45-48) are therefore considered to be complied with.

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4.2 CPA Project Design Documents

GLC can confirm that the CPA-DD generic and CPA-DD specific case have been completed in accordance with relevant [Form and Guidance](#) as provided by UNFCCC. The most recent version of the CPA-DD generic and CPA-DD specific case form (CDM-SSC-CPA template version 01) have been used with relevant information provided by the participants in the applicable sections. Correctness and completeness was assessed and documented through the questionnaire included in Annex A.

4.3 CPA Description and the Technology to be applied

The main objective of this CPA is the dissemination of improved cooking stoves (ICS) in Ghana. The CPA shall be implemented using biomass-fired energy efficient stove categories that would replace existing less efficient biomass-fired cooking stoves or cooking regimes. The three stove models to be deployed in this CPA are [CH 2200](#) with an [average thermal efficiency of 38.2%](#)^{/56/}, [CH 2300](#) with an [average thermal efficiency of 39.4%](#)^{/54/} and [CH 4400](#) with an [average thermal efficiency of 31.4%](#)^{/57/}. It is worth mentioning that [CH 2300](#) is a variation of [CH 2200](#) (mentioned in the PoA-DD) but with rounded bottom pot support. This was adapted from [CH 2200](#) after end users' feedback following a pilot programme in Kumasi^{/45/}. A value of **36.3%** has been applied as the 'efficiency of the system being deployed' in estimating the emission reduction based on an equal deployment of all three models. This is conservative given that [CH 2300](#) with an average thermal efficiency of **39.4%** is more popular than [CH 2200](#) and [CH 4400](#) as per the end users' feedback after the pilot project^{/45/}. Actual emission reductions attained by this CPA shall be calculated using a weighted average stove efficiency derived from actual deployment of ICS as indicated in the PoA database. These ICSs have been designed by [Envirofit International Ltd](#) in the USA, tested according to [Emission and Performance Test Protocol](#)^{/13/} ([Biomass stove performance and development of an improved testing protocol](#)) developed by Colorado State University and the stoves are manufactured in China.

The pre-project scenario is the use of woody biomass, which can either be wood-fuel (fuelwood) or charcoal used in the traditional "three-stone" fire or in other conventional low efficient cooking regimes by low-average income households for cooking. This has been confirmed by the following sources:

- The [2002 National Action Programme to Combat Drought and Desertification](#) in Ghana^{/31/} which states *"With increasing urbanization the demand for the mix of fuelwood and charcoal will grow in favour of charcoal. Per capita consumption of charcoal and fuelwood is estimated as 0.43-0.46 and 1.43 kg/person/day respectively...In 2000 charcoal consumption was 1 037 610 tonnes with a growth rate of 5 %."*
- [Energy Enterprise Learning Platform -Ghana](#)^{/34/} states *"Wood fuel accounts for 85.8% of primary energy used in Ghanaian homes... In 2000, 16 million metric tons of wood fuel was consumed, 9 million of which was converted to charcoal. As of 2001 the rate of deforestation of Ghana's forest was 740,000 hectares per year (1.7% annual deforestation rate)".*
- November 2011 [Low Carbon Africa](#) states *"Charcoal is the main cooking fuel for approximately 1.3 million households (31 per cent) in Ghana. Fifty-three per cent of urban and 14 per cent of rural households depend on charcoal to meet their cooking energy needs. However, charcoal*

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production has been singled out as a major cause of forest degradation and deforestation in Ghana.”

The energy-efficient ICSs to be employed in this CPA consume less woody biomass due to their design and technology. The amount of woody biomass that would be saved due to the implementation of the CPA shall directly translate into reduction of GHG emissions. The CPA shall also lead to a reduced pressure on forests and woody biomass resources, reduced indoor air pollution associated with use of traditional stoves and to reduction in women and child mortality rate since according to ICSU July 2007 [Sustainable Energy in Sub-Saharan Africa](#)^{/8/} “It is estimated that **393 000 deaths** in sub-Saharan Africa in 2002 were due to indoor air pollution from the burning of biomass fuels (WHO, 2006). It is particularly dangerous to women and children as they do most of the cooking.”

Based on interviews conducted on-site, local knowledge and sectoral expertise there are no mandatory policies or regulations mandating the adoption of ICS in Ghana. The proposed CPA is therefore a voluntary action undertaken by the Coordinating and Managing Entity – [Envirofit International Ltd.](#)

The PPs intend to disseminate up to **4 500** stoves (a mix of [CH 2200](#), [CH 2300](#) and [CH 4400](#)) over a 10 year crediting period; and given that the CPA would be implemented as described in the CPA-DD, it is likely to achieve the estimated amount of emission reductions of **154 770 tCO₂e** over the ten year crediting period, leading to a calculated annual average of **15 477 tCO₂e** as indicated in the final CPA-PDD^{/1/} and also in the calculation sheet **ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2**^{/11/}.

The description of the CPA is complete, accurate and in compliance with the PoA-DD and CPA-DD templates and guidelines and GLC is able to confirm that the CME is in the position to implement the CPA as described in the CPA-DD in collaboration with [Centre for Energy, Environment and Sustainable Development](#) (CEESD) as the CPA implementer.

Also, the technology employed is environmentally safe and sound.

4.4 Compliance of the CPA against the Inclusion Eligibility Criteria under the PoA

The Coordinating and Managing Entity (CME) has justified, with credible and sufficient evidences, the compliance of the CPA against the Eligibility Criteria (EC) for the inclusion of a CPA under the PoA. The justification of the CPA compliance against the Eligibility Criteria as listed in PoA-DD section A.4.2.2 and section B.2 of the generic CPA-DD have been validated by GLC in accordance with:

- The applicability of the applied methodology [AMS-II.G version 03](#)^{/2/},
- Technological requirements,
- manufacturer's specifications for ICSs (specifications of technology/measure including the level and type of service (stove efficiency)),
- CPA location and boundary,
- Start date of CPA,

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- Scale of CPAs or conditions to ensure that every CPA in aggregate meets the small scale or microscale threshold criteria and remains within those thresholds for the entire creating period,
- Additionality requirement of each CPA,
- Monitoring requirements of each CPA including sampling approach and plan,
- Host country laws and regulations,
- Local Stakeholder Consultations,
- Environmental Impact Analysis,
- Contracts signed between the CME [Envirofit International Ltd](#) and CPA implementer [Centre for Energy, Environment and Sustainable Development](#),
- Avoidance of double counting of ICS under this PoA or in another PoA
- De-bundling Check.
- Calculation of CPA or country specific ex-ante parameters

This is in accordance with EB 70 Annex 5 and EB 65 Annex 3 of 25 November 2011: [PoA Standard](#)^{/3/} and also according to [Validation and Verification Manual](#) paragraph 167 which says eligibility criteria should “...include inter alia the means of demonstrating the additionality of the CPA and the applicability of the applied methodology”^{/6/}. Details of the evaluation of the compliance of this CPA to the Eligibility Criteria for inclusion in the PoA have been presented in [Table 3 \(in the annex\)](#) in this report.

GLC can therefore confirm that the list of Eligibility Criteria as indicated in the final PoA-DD and applied in this CPA is appropriate and complete and that this CPA fully complies with the validated Eligibility Criteria.

4.5 Baseline and Monitoring Methodology

4.5.1 Applicability of the Selected Methodology to the Programme of Activity

GLC has checked the compliance with each applicability criterion as listed in the applied baseline and monitoring methodology “AMS-II.G.: [Energy efficiency measures in thermal applications of non-renewable biomass](#) version 3.0 ^{/2/} and can confirm that all applicability criteria have been demonstrated. The version of the approved methodology ([AMS-II.G version 03](#)^{/2/}), is valid during submission for registration.

The assessment was carried out for each applicability criterion and included, among others, the compliance check of the local project setting with the applicability conditions with regard to baseline setting and eligible project measures. This assessment also included the review of other sources not provided by PPs, and these sources could confirm that applicability conditions are complied with since:

- The project involves the replacement of less efficient cooking system with better energy efficient biomass-fired cooking stoves. The three stove models to be deployed in this CPA are [CH 2200](#) an [average thermal efficiency of 38.2%](#)^{/56/}, [CH 2300](#) with an [average thermal efficiency of 39.4%](#)^{/54/} and [CH 4400](#) with an [average thermal efficiency of 31.4%](#)^{/57/} measured according to

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[Emission and Performance Test Protocol](#)^{/13/}. A value of **36.3%** has been applied as the 'efficiency of the system being deployed' in estimating the emission reduction based on an 'equal deployment of all three models.

- According to [Trends in removals of wood products 1990-2005](#)^{/14/} which states "*Change in Forest Cover: Between 1990 and 2010, Ghana lost an average of 125,400 ha or 1.68% per year. In total, between 1990 and 2010, Ghana lost 33.7% of its forest cover or around 2,508,000 ha.*" It is also indicated in FAO's Ghana [Global Forest Resources Assessment 2010](#)^{/15/} that in 1989 **14 800 500 m³** (over bark) of fuelwood were harvested. Similarly, according to [TED Case Study – Ghana Forest Loss](#)^{/35/} "*Since 1981, the annual rate of deforestation in Ghana has been two percent/year or 750 hectares each year. Ghana's tropical forest area is now just 25 percent of its original size.*" This means woody biomass has been in use since December 1989.
- According to the [Study of the Social and Poverty Impacts of Energy Interventions on Rural Communities in Ghana](#)^{/25/} "*The time spent in collecting wood fuel for cooking, however, is significant and is done primarily by women and children. This human resource spent on meeting energy needs is part of the cycle of poverty*"

GLC is able to confirm that all applicability conditions of the applied methodology have therefore been met and the CPA design is in line with all requirements and stipulations mentioned in all sections of the applied methodology. The CPA design is not expected to result in significant emissions related both to project and leakage other than those listed in the methodology.

Emission sources, which are not addressed by the applied methodology, and are expected to contribute more than 1% of the overall expected annual average emission reductions, have not been identified.

According to EB 63, Annex 23 "[Guidelines for demonstrating additionality of microscale project activities](#)" version 03^{/9/}, CPA achieving energy savings at a scale of no more than 20 gigawatt hours per year (equivalent to **60 gigawatt hours thermal²** per year) are considered microscale CPAs.

This CPA is exempted from performing de-bundling check as per EB 54, Annex 13, par. 10 [Guidelines on Assessment of De-bundling for SSC Project Activities](#)^{/5/}, i.e. considered as being not a de-bundled component of a large scale activity since according to the energy saving calculations in the calculation sheet **ER-African Improved Cooking Stoves PoA_CPA1 Ghana ver3.2**^{/11/}, energy savings per ICS is about **13 MWh_{th}/year**, which far below the **1.8 GWh_{th}/year** threshold (equivalent of 600 MWh^{/4/}).

This project therefore fulfils all the applicability criteria of the applied methodology and the tools therein.

4.5.2 CPA Boundary and Sources of GHG included in the Boundary

As per [AMS-II.G version 03](#)^{/2/} „*The project boundary is the physical, geographical site of the efficient systems using biomass*“. The CPA boundary is defined as the geographical area of the host country

² According to [Clarification about the threshold of thermal energy savings in AMS-II.G](#)^{/19/} "*The SSC WG agreed to clarify therefore AMS-II.G is applicable to project activities with maximum **thermal** energy savings of **180 GWh per year***"

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within which the CPA will be implemented – Ghana in this case. As indicated in section A.4.1.2 of the CPA-DD the actual boundary of the SSC CPA, however, confines to the physical location of the stoves i.e. the households where the stoves are used.

The physical delineation of the CPA and the description of the emission sources and GHGs that are included in the CPA boundary are appropriate for the purpose of calculating project and baseline emissions for each CPA. There are no other sources which are impacted by the project that are not addressed by the applied methodology.

4.5.3 CPA Baseline Identification

The procedure to identify the most plausible baseline scenario derived from the applied methodology has been applied correctly and is transparently and sufficiently documented in the PoA-DD and in the CPA-DD as prescribed by Eligibility Criteria No. 17.

As prescribed by the methodology [AMS-II.G version 03^{2/}](#) „It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs“. Baseline emission avoided by the implementation of the CPA is calculated based on emission factor for the substitution of non-renewable woody biomass by similar consumers, quantity of woody biomass that is saved in tonnes, fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass, and on net calorific value of the non-renewable woody biomass that is substituted. GLC can confirm based on the onsite visit in Ghana that the baseline scenario is the use of non-renewable biomass for cooking in a „three-stone“ system or in some kind of low efficient conventional stoves.

The fraction of woody biomass used in the absence of the project activity in year y that can be established as non renewable has been determined as per the relevant provisions of [AMS-II.G version 03^{2/}](#).

Efficiency of the system being replaced (fraction) shall be measured using representative sampling methods or based on referenced literature values or weighted average values shall be used if more than one type of system is being replaced. A default value of 0.10 may be optionally used if the replaced system is a three stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system, i.e. without a grate or a chimney and for other types of systems a default value of 0.2 may be optionally used.

During the on-site audit for this first CPA, conducted from January 25 to January 28, 2012 GLC audit team interviewed 24 would-be end users of ICS (randomly and unarranged) in order to validate the baseline stove and/or efficiency of the system being replaced. It was discovered that the population in the Ghana CPA use a wide variety of stoves – some conventional and some kinds of ICS and still some between conventional and ICS. This is also confirmed by the [GTZ April 2008 report on Charcoal in Africa: Importance, Problems and Possible Solution Strategies^{21/}](#) which states “Most households use traditional stoves, which are cheap (from 1.5 to 2 US\$ up) and can be afforded even by poorer households. Examples are traditional stoves from **Ghana**, Kenya, Madagascar and Uganda. Usually they are made of metal without insulation, which allows most of the heat to escape. Although these stoves are slightly more efficient (10 – 25 %) than the three stone fire using wood, their use wastes a lot

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of charcoal... Traditional charcoal stoves are very common in African cities, used by up to 80 % of the households”.

[Energy Enterprise Learning Platform -Ghana](#)^{34/} “In aiming at reduced deforestation, a few non-governmental organizations have introduced and promoted the use of various types of efficient biomass cook stoves on the Ghanaian market as alternatives to traditional ‘coal pots’. These stoves reduce charcoal consumption for household and commercial cooking. However, the fact still remains that the source of fuel (mainly charcoal) could still be improved for carbon emissions reductions, which could further be monetised on international derivatives markets”. Considering therefore that Ghana has seen a certain degree of ICS penetration, a CAR was raised regarding the choice of 0.1 or 10% efficiency of the system being replaced mentioned in the CPA-DD uploaded for GSC. However, according to November 2011 [Low Carbon Africa-Ghana](#)^{49/} “There is a huge opportunity for the improved cookstoves projects to be replicated and scaled-up. This is because only **23 per cent** of the potential charcoal cookstoves market has been reached, not to mention the equally huge improved firewood cookstoves market that remains practically unserved. Similarly, according to [Ghana Demographic and Health Survey](#)^{50/} “The GDHS 2008 results indicate that all (100 percent) households that use solid fuel for cooking do so without a chimney or hood, and there is no marked difference between urban and rural areas. A closed fire or stove with a chimney is used by less than **1 percent** of households in Ghana.”

The 2009 [WHO-UNDP](#)^{51/} „Access to improved cooking stoves is also very limited. In LDCs and SSA, only **7 percent** of people who rely on solid fuels use improved cooking stoves to help reduce indoor smoke.“ Therefore, the weighted average efficiency of **0.101** or **10.1%** of the system being replaced in Ghana presented by the PP and validated by GLC is confirmed to be appropriate, representative and conservative.

As for the calculation of the fraction of non-renewable biomass fraction (f_{NRB}), according to [Trends in removals of wood products 1990-2005](#)^{14/} in Ghana, harvested wood can either be industrial roundwood or woodfuel. GLC audit team therefore questioned the conservativeness of the approach adopted by PP by applying total harvest (industrial roundwood and for fuelwood) in the calculation of f_{NRB} . PPs have conservatively adopted the approach in [Information note: Default values of \$f_{NRB}\$ for LDCs and SIDs](#)^{54/} of annex 20 of CDM-SSC WG 35th Meeting Report (or in EB 67 Annex 22) for the calculation of f_{NRB} whereby only biomass used in household is considered and not the total biomass harvest. The f_{NRB} value for this first CPA in Ghana so obtained is **99%**. This is same as the [default value for Ghana](#) and the figure is also mentioned in the **CookClean Ghana Limited —CPA01** under the CDM PoA [Clean Cook Stoves in Sub-Saharan Africa by ClimateCare Limited](#) undergoing validation. GLC can therefore confirm that the baseline for the first CPA in Ghana (i.e. with respect to the fraction of woody biomass used in the absence of the project activity in year y that can be established as non renewable) has been calculated correctly and according to the applied methodology. The approach used by PPs to determine the fraction of non-renewable woody biomass (f_{NRB}) as indicated in the final PoA-DD has been evaluated to be appropriate. For this CPA the sources of data applied are reliable and publicly available. Use has been made of default values from reliable sources such as 2010 Forest Management and Legal Status in [FAO FRA 2010, global tables, table 6](#)^{17//11/} and data from [IPCC 2006, Vol. 4, Table 4.9](#)^{18//11/}.

It is worth mentioning that GLC relied on publicly available information instead of on nationally obtained statistics to validate the baseline since according to FAO's [Assessment of the status of the development](#)

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of the standards for the Terrestrial Essential Climate Variables^[26] “... biomass information is uncertain for many developing countries, which are often those undergoing the fastest rates of deforestation. National inventories differ greatly in definitions, standards and quality, and the detailed information available at national level is normally unavailable internationally”.

GLC can confirm that the calculation method of f_{NRB} in CPA-DD is consistent with that presented in the PoA-DD and the sources of the parameters have been confirmed to be appropriate.

Based on interview, sectoral expertise and local knowledge, there are no mandatory policies or regulations mandating the adoption of ICS in Ghana. The proposed PoA is therefore a voluntary action undertaken by the Coordinating and Managing Entity – [Envirofit International Ltd.](#)

Through document review and based on interview with the CME it has been verified that the baseline scenario is identified according to the methodology; and in regard to item 87 of VVM. GLC hereby confirms the following statements:

- a) All the assumptions and data used by the project participants are listed in the CPA-DD, including their references and sources;
- b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the CPA-DD;
- c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- d) Relevant national and/or sectoral policies and circumstances are considered and listed in the CPA-DD;
- e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

4.5.4 Algorithms and Formulae used to Determine Emission Reductions

The CPA-DD has applied the required approach and equations to calculate baseline emissions, project emissions, leakage and emission reductions as per the applied methodology, [AMS-II.G version 03](#)^[2].

Detailed information on the validation of the parameters used in the equations can be found in Annex A – Validation Questionnaire. The algorithms for the determination of the baseline, project, and leakage emissions are discussed below in subsequent sections of this report.

Corresponding calculations were carried out based on the calculation spreadsheets – **ER-African Improved Cooking Stoves PoA CPA1 Ghana_ver3.2**^[1] for this CPA in Ghana. The parameters and equations presented in the PoA-DD and CPA-DD as well as in other applicable documents have been compared with the information and requirements presented in the methodology and other applicable tools. The equation comparison has been made considering all the formulae presented in the final

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calculation sheet **ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2** ^{/11/} submitted together with this report.

The assumptions and data used to determine the emission reductions are listed in the CPA-DD and all the sources have been checked and confirmed (Sections B.5 and E.6 of CPA-DD questionnaire).

Based on the information reviewed it can be confirmed that the sources used are correctly quoted and interpreted in the Ghana CPA-DD. The values presented in the PoA-DD and in the Ghana CPA-DD are considered reasonable based on the documentation and references reviewed as well as on the result of interviews conducted during the site visit.

The baseline methodology has been correctly applied according to requirements.

The estimate of the baseline emissions can be confirmed to be the same as that which have been replicated by the audit team using the information provided.

Detailed information on the validation of the parameters used in the equations can be found in Annex A – Validation Questionnaire. The algorithms for the determination of the baseline, project, and leakage emissions are discussed below in subsequent sections of this report.

Baseline Emission of a typical CPA:

As per [AMS-II.G version 03](#)^{/2/}, the main sources of baseline emissions are CO₂ emissions from fossil fuels (or Non Renewable biomass) used in households for cooking.

The baseline emissions avoided due to the implementation of a CPA are calculated using the equation

$$ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

PPs have used publicly available data from **2010 Forest Management and Legal Status** in [FAO FRA 2010, global tables, table 6](#)^{/17//11/} and data from [IPCC 2006, Vol. 4, Table 4.9](#)^{/18//11/} in calculating the fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass (f_{NRB}). The Quantity of woody biomass ($B_{y,saving}$), in tonnes, that is saved by the implementation of a CPA has been determined from estimate of average annual consumption of woody biomass per appliance ($Q_{biomass}$ tonnes/year) multiplied by the number of appliance (N_{all}).

PPs have conservatively adopted the approach in [Information note: Default values of \$f_{NRB}\$ for LDCs and SIDS](#)^{/43/} of annex 20 of CDM-SSC WG 35th Meeting Report for the calculation of f_{NRB} whereby only biomass used in household is considered and not the total biomass harvest. This is according to [Clarification on the determination of \$f_{NRB}\$ in AMS-II.G](#)^{/28/} “woody biomass is determined to be renewable based on the area(s) from which the woody biomass ,originates” and “both NRB and DRB refer to quantities of woody biomass used” as woodfuel for cooking. The f_{NRB} value for the first CPA in Ghana so obtained is **99%**.

The calculations of $B_{y,saving}$ and the assumptions and references as presented in **ER-African Improved Cooking Stoves PoA_CPA1 Ghana ver3.2** ^{/11/} are transparent and traceable.

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GLC can therefore confirm that the baseline emissions for this CPA in Ghana have been calculated correctly and according to the applied methodology [AMS-II.G version 03^{2/}](#).

Project Emission of a typical CPA:

The main sources of project emissions as per the methodology are CO₂ emissions from fossil fuel consumption for cooking in the project activity. However, the calculation of project emission has not been foreseen in the applied methodology since this has been factored in the determination of the Quantity of woody biomass ($B_{y,saving}$), in tonnes, that is saved by the implementation of a CPA.

Leakage Emission of a typical CPA:

According to the applied methodology [AMS-II.G version 03^{2/}](#) project activity under a programme of activities can apply this methodology if leakages are estimated and accounted for.

In section B.5.2 of CPA-DD PPs have indicated that the use and /or diversion of non-renewable woody biomass saved under the project activity by non-project households or users that previously used renewable energy sources will be accounted for. This so-called *'bounce effect'* has been accounted for by adjusting the quantity of biomass used in the absence of the project activity (B_{old}) or by multiplying this parameter by a **net-to-gross adjustment factor of 0.95 (LAF)** to account for this leakage in which case surveys are not required. The calculation presented in **ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2^{11/}** has been cross checked and GLC can confirm that it is appropriately and transparently done.

Emission Reductions of a typical CPA:

Emission reductions would be the emissions avoided by the implementation of the project activity discounted by any leakage emissions caused by the project activity. The ER is calculated as follows:

$$ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$$

This first CPA would achieve a total emission reductions of **154 770 tCO₂e** in the **10 year** crediting period and an average of **15 477 tCO₂e** per year as indicated in the final CPA-PDD^{1/} and also in the calculation sheet - **ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2^{11/}**.

In conclusion, all values used in the PoA-DD and CPA-DD to calculate emission reductions are considered reasonable in the context of the proposed SSC CPA project activity and calculation approach is correct.

4.6 Additionality of the CPA

Additionality of this CPA has been demonstrated by establishing that in the absence of CDM the implementation of the CPA would not occur.

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The **African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)** is additional – the emission reductions achieved by the CPA would be below those that would have occurred without the implementation of the CPA.

Additionality of the micro-scale CPA has been demonstrated by applying EB 65 Annex 3 [PoA Standard](#)^[3] which states “*PoAs that will include one or more microscale projects as CPA shall include eligibility criteria derived from all the relevant requirements of the Guidelines for demonstrating additionality of microscale project activities*”. This is discussed further below under Additionality of the micro-scale CPA.

4.6.1 Prior Consideration of the Clean Development Mechanism

The starting date of the PoA is **15/12/2012**, defined as the date of publication of the PoA-DD for global stakeholder consultation in accordance with the relevant CDM rules and requirements. The start date of the PoA is therefore reasonably defined as per EB 70 Annex 07 CDM Glossary of terms version 07/30/.. The start date of this CPA is **03/01/2012** which is after the publication of the PoA for GSC on **13/12/2011**. This is the date of first shipment of the ICS to be distributed from the port in China as indicated in the Bill of Lading.^[4] The start date of the PoA and CPA are therefore reasonably defined as per EB 70 Annex 07 CDM Glossary of terms version 07/30/...Therefore the PoA is exempted from the assessment of prior consideration of the CDM. .

4.6.2 Identification of Alternatives to the PoA

According to document review and follow up interviews with PPs, it can be confirmed that this CPA fulfils the micro-scale criteria.

According to EB 70 Annex 5 and EB 65 Annex 3 [PoA Standard](#)^[3], “*PoAs that will include one or more microscale projects as CPA shall include eligibility criteria derived from all the relevant requirements of the Guidelines for demonstrating additionality of microscale project activities*”.

Identification of alternatives to the PCPA is therefore not applicable.

4.6.3 Barrier Analysis (For SSC CPA)

Additionality of a typical micro-scale CPA shall be demonstrated by applying EB 70 Annex 5 and EB 65 Annex 3 [PoA Standard](#)^[3] which states “*PoAs that will include one or more microscale projects as CPA shall include eligibility criteria derived from all the relevant requirements of the Guidelines for demonstrating additionality of microscale project activities*”.

Barrier analysis is therefore not applicable since the CPA fulfils the micro-scale criteria.

4.6.4 Additionality of the Microscale CPA

Additionality of this micro-scale CPA has been demonstrated by applying EB 70 Annex 5 and EB 65 Annex 3 [PoA Standard](#)^[3] which states “*PoAs that will include one or more microscale projects as CPA shall include eligibility criteria derived from all the relevant requirements of the Guidelines for demonstrating additionality of microscale project activities*”.

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The adopted EB 63, Annex 23 “[Guidelines for demonstrating additionality of microscale project activities](#)” (version 03)^{/9/} has been applied to this CPA since

- it aims to achieve energy savings at a scale of no more than 20 gigawatt hours per year (equivalent to **60 gigawatt hours thermal per year**). Based on the energy saving calculations included in the calculation file **ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2^{/11/}**, energy savings per ICS is about **13 MWh_{th}/year**. Considering that 4 500 ICS would be operational per year in the micro-scale CPA, this corresponds to **59 GWh_{th}/year** of energy savings per CPA. This is below the 60 GWh_{th}/year threshold.
- each of the independent subsystems or measures (ICS) in the CPA will achieve an estimated annual energy savings equal to or less than 600 megawatt hours (equivalent to **1.8 gigawatt hours thermal per year**). In this case the end users of the subsystems or measures are households or communities or small and medium size enterprises (SMEs). Based on the energy saving calculations included in the calculation file **ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2^{/11/}**, energy savings per ICS is about **13 MWh_{th}/year**, which far below the **1.8 GWh_{th}/year** threshold.

It is worth mentioning that as GLC was concluding the validation of this CPA Attachment A of Appendix B saw its name changed during EB 68 to “Guidelines on the Demonstration of Additionality of Small Scale Project Activities”^{/59/} version 09. It provides the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). Amongst the list are “*Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds.*” For this CPA each ICS would save about **13 MWh_{th}/year** which is far less than 5% of the small scale or micro scale threshold as indicated above and users of the technology/measure (the improved cook stoves) are households or communities or Small and Medium Enterprises (SMEs). This CPA is therefore deemed to be automatically additional.

Correctness and completeness of the additonality demonstration for this microscale CPA was assessed and documented through the questionnaire (section B.3) included in Annex A.

4.7 CPA Monitoring Plan

All parameters to be monitored for this CPA will be monitored according to the Monitoring Plan outlined in B.6.1 of the CPA-DD.

Primary data will be collected by CPA implementers stored according to the procedures defined in section B.6.1 of the CPA-DD. This will include the monitoring of the following parameters:

Data or Parameter to be Monitored		Means of Measurement/Monitoring
1	Efficiency of the system being deployed (η_{new})	This shall be done using Water Boiling Test as prescribed by the methodology AMS.-II.G version 03. This shall involve annual check of the efficiency of all appliances deployed as part of the project activity or

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		<p>a representative sample thereof, at least once every two years (biennial).</p> <p>The three stove models to be deployed in this CPA are CH 2200 with an average thermal efficiency of 38.2%^{/56/}, CH 2300 with an average thermal efficiency of 39.4%^{/54/} and CH 4400 with an average thermal efficiency of 31.4%^{/57/}. It is worth mentioning that CH 2300 is a variation of CH 2200 (mentioned in the PoA-DD) but with rounded bottom pot support. This was adapted from CH 2200 after end users' feedback following a pilot programme in Kumasi^{/45/}. A value of 36.3% has been applied as the 'efficiency of the system being deployed' in estimating the emission reduction based on an equal deployment of all three models. This is conservative given that CH 2300 with an average thermal efficiency of 39.4% is more popular than CH 2200 and CH 4400 as per the end users' feedback after the pilot project^{/45/}. However, actual emission reduction shall be calculated using weighted average ICS efficiency based on actual deployment of all three types of ICS: CH 2200, CH 2300 and CH 4400 as indicated in the PoA database.</p>
2	Total number of stoves installed (N_{all})	The value will be obtained from the PoA Distribution & Monitoring Database maintained by the CME.
3	Stove Operation Fraction (SOF)	<p>Measured ex-post through survey / user feedback. This shall involve checking of all appliances or a representative sample thereof, at least once every two years (biennial) to determine if they are still operating or are replaced by an equivalent in service appliance.</p> <p>Neither the parameter nor any default value is explicitly mentioned in the applied methodology. However, PP has assumed a value of 0.95 (95%) in the PoA-DD in estimating emission reduction. This was done to maintain the micro-scale threshold limit.</p>
4	Amount of woody biomass Consumption due to continuous use of old stove or Baseline Stoves (μ_{old})	<p>This is measured ex-post by household survey and according AMS II.G v03. The survey will be done on the basis of the end user's estimation of the amount of wood or charcoal used per day, the number of times per week/month/year.</p> <p>Neither the parameter nor any default value is explicitly mentioned in the applied methodology. However, PP has assumed a value of 0.05 (5%) in the PoA-DD in estimating emission reduction. This</p>

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		was done to maintain the micro-scale threshold limit.
5	The fraction of end users that are still using baseline (replaced) stoves (f_{old})	Sampling will done <i>ex-post</i> to estimate the value of this parameter by monitoring the fraction of end users <i>not</i> using baseline stoves ($f_{non,old}$), where: $f_{old} = 1 - f_{non,old}$
6	Calculated average stove operation years in the monitoring period ($Stove_{year}$)	This shall be obtained from the PoA Distribution and Monitoring Database. For a stove that has been in operation for D days in a year ($Stove_{year} = D/365$).

In addition to the above monitored parameters, PP has opted to account for **Fractional increase in NRB usage by households outside the project boundary** or leakage emissions related to the non-renewable woody biomass saved by the project activity (or the *bounce effect*) by discounting the quantity of biomass used in the absence of the project activity (B_{old}) with a **net-to-gros adjustment factor (LAF) of 0.95** to account for this leakage.

PP shall not only monitor the continuous use of old baseline stoves but the use of two or more stoves in parallel in a single household. Emission reductions shall only be credited to one improved cookstove per household even if more than one improved cookstoves are found in a household. Overall emission reductions achieved by this CPA shall be discounted or calculated in the most conservative manner as required.

It is worth mentioning that the assumption in the CPA-DD that an average one stove is used per household is deemed reasonable based on the site visit.

GLC can confirm that the parameters to be determined ex-post have been presented correctly and according to requirements of the applied methodology.

Parameters determined *ex-ante*

For the data and parameters not to be monitored throughout the crediting period (i.e. they are determined only once and thus remain fixed throughout the crediting period), it is assessed that all data sources, assumptions and calculations are correct, applicable to the project and contribute to a conservative estimate of the emission reductions. For the data and parameters subject to monitoring, it is confirmed that the ex-ante estimated values for the monitoring parameters are plausible, and the emission reduction estimates provided in the PoA-DD are reasonable and conservative (See PoA Questionnaire section E.6.3 in annex 1 of PoA-DD validation report).

CPA or country specific *ex-ante* parameter, such as the fraction of non renewable biomass, has been calculated following the approach recommended by the SSC WG. The applied approach resulted in a calculated f_{NRB} value of **99%** for Ghana. This is same as the [default value for Ghana](#) and the figure is also mentioned in the **CookClean Ghana Limited —CPA01** under the CDM PoA [Clean Cook Stoves in Sub-Saharan Africa by ClimateCare Limited](#) undergoing validation.

Considering that Ghana has seen a certain degree of ICS penetration, a calculated weighted average efficiency of **0.101** or **10.1%** of the system being replaced in Ghana presented by the PP and validated by GLC is confirmed to be appropriate, representative and conservative compared to the default value

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recommended by the methodology and based on the sources of the data quoted by the PP and validated by GLC.

The quantity of biomass used in the absence of the CPA in tonnes/year (B_{old}) has been calculated taking into consideration the stove drop-off rate or stove operation fraction, average stove operation year, continuous use of old or 'replaced' stoves and the total number of ICS deployed in the CPA. GLC can confirm that the value of B_{old} of **17 602 tons** calculated is conservative and appropriate. The formulas are interpreted in the calculation file **ER-African Improved Cooking Stoves PoA _CPA1 Ghana_ver 3.2^{11/}** has been checked and reproduced by GLC.

In conclusion, all values used in the PoA-DD and CPA-DD to calculate emission reductions are considered reasonable in the context of the proposed SSC CPA project activity and calculation approach is correct.

The Sampling Method that shall be applied

All parameters to be monitored for this CPA as detailed in section E.7.1 of PoA-DD will be monitored according to the Monitoring Plan outlined in E.7.2. of PoA-DD. In other words this CPA shall be grouped together with other similar CPAs and cross-CPA sampling shall be applied.

PP has developed a 'PoA-wide sampling plan', based on simple random sampling, according to the applied methodology [AMS-II.G version 03^{2/}](#) and as per EB 69 Annex 5 & 4 "Guidelines for sampling and surveys for CDM project activities and programme of activities (version 02.0)" and [Standard for Sampling and Surveys for CDM Projects Activities and PoAs version 3.0^{32/}](#), with the requirements of the applied methodology taking precedence.

PP shall apply 95/10 confidence/precision whenever sampling across a group of CPAs (i.e sampling at PoA level). This would be for parameters, such as efficiencies of the deployed stoves and stove operational fraction, which are not expected to vary largely across CPAs. GLC can confirm that this is in line with [Standard for Sampling and Surveys for CDM Projects Activities and PoAs version 3.0^{35/}](#) which states "when a single sampling plan covering a group of CPAs is undertaken..." apply "...95/10 confidence/precision for the sample size calculation".

The sample size calculation as presented in Annex 3 of the PoA-DD has also been reproduced by GLC and it can be confirmed that the proposed sample size calculation approach and sampling method follows the *best practice example* according to § 50 of EB 69 Annex 5 and it is adequate to achieve the minimum confidence/precision requirements (i.e. 95/10 confidence/precision in case of grouped sampling).

In order to ensure that samples would be drawn randomly, PP shall apply the inbuilt excel function to randomly select numbers corresponding to unique ID of cookstoves belonging in a group in case of group sampling across CPAs or to unique ID of cookstoves in case of simple random sampling of cookstove devices. GLC can confirm that the approach presented by PP can be deemed as appropriate and it is in line with § 37(d) of EB 69 Annex 5.

The sample plan does identify different sample frames based on the fuel type, class of end users and geographic distribution region of ICS under the PoA. The sampling frame into which this CPA fits as provided in section B.6.1 of the CPA-DD is deemed by GLC as appropriate.

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Through document check and interview it can be confirmed that the monitoring plan described in PoA-DD provides sufficient information and is in compliance with the methodology. It includes elements of sampling design, data to be collected and an implementation plan and the CPA-DD outlines how the CPA will be integrated into the PoA sampling plan. All the monitoring arrangements are feasible within the CPA and therefore within the PoA project design and project participant's competence as per VVM paragraphs 122 - 124.

The monitoring plan is to be implemented to enable subsequent verification of emission reductions. The application of the monitoring methodology is transparent and GLC can confirm that the CME will be able to implement the monitoring plan and the project emission reductions would be able to be reported ex-post and verified.

4.8 CPA Crediting Period

The CPA crediting period has been clearly defined as fixed 10 year crediting period and it will start on 15-12-2012 or the date of inclusion, whichever is later. The information has been indicated correctly in section A.4.3 of the CPA-DD. It has been also confirmed that the end date of the CPA crediting period will not exceed the PoA end date.

4.9 Local Stakeholder Consultation

PP has opted to conduct Local Stakeholder Consultation at CPA level since the PoA is international. This is as indicated by PP in the final PoA-DD.

For this first CPA a Local Stakeholder Consultation^[24/] was conducted on November 14, 2011 in Accra. In addition to the advert placed in the local Newspaper - [The Ghana News Agency](#), invitation letters were sent to individuals, government officials, NGOs, Artisans and to local organisations. Stakeholders were identified as those whose activities directly or indirectly impact the project, and those who were to be impacted by the project activities. The 18 page report^[24/] includes a full list of participants and photos. A sample text of the invitation sent to individual stakeholders as well as a sample of the published invitation has been included in the report. A manually signed list of over 60 participants has also been provided as part of the LSC Report^[24/]. The LSC included an introduction of the ICSs and a demonstration on how they are used. The concept of CDM and the additional revenues it generates was also introduced. A full length video of the LSC was also played to the audit team during the site visit. Attendees were allowed to ask questions during a Q&A session. A stakeholder was concerned about the potential of setting up a manufacturing unit in Ghana and the source of raw material for stove manufacturing and **Nathan Lorenz** of [Envirofit International Ltd](#) response was *"Our goal is to source as much materials as possible locally. Maybe some materials/parts will still need to be imported e.g. the combustion chamber which contains a special alloy."*

Similarly, another attendee wanted to know the price of the stoves and the response from **Ron Bills**, CEO of [Envirofit International Ltd](#) was *"The cost of the stove will be around the double price as the price customers pay in the market. The exact market price is still being developed. It is crucial to make sure all entities down the supply chain are significantly incentivized to allow a fast scale-up. The goal is to sell it to the lowest price possible to reach the bottom of the pyramid."*

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A summary of the LSC is available in section D.2 of the CPA-DD and given the positive comments received, no significant comment was necessary to be taken into account in the CPA design.

GLC can therefore confirm that the right means of inviting stakeholders' comment was used and that the relevant stakeholders attended the meeting.

4.10 Environmental Impacts Analysis (EIA)

PP has opted to conduct Environmental Impacts Analysis at CPA level since the PoA is international. This is as indicated by PP in the final PoA-DD.

In a reply to an email sent by [CEESD](#) to [Environmental Protection Agency](#) of Ghana, Mr Kyekyeku Yaw Oppong -Boadi wrote „As per the e-mail sent to you the EPA has studied your PIN and the PoA and you are advised that the nature of your undertaking does not require the preparation of EIA“. GLC can confirm, based on local knowledge and on sectoral expertise, that the implementation of improved cook stoves does not require the PPs to undertake an Environmental Impact Analysis in Ghana.

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5 VALIDATION OPINION

Germanischer Lloyd Certification GmbH has performed a validation of **African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)**. The validation was performed on the basis of UNFCCC criteria and CPA host country criteria, as well as criteria given to provide consistent project operations, monitoring and reporting.

The review of the CPA design documentation and the subsequent follow-up interviews have provided Germanischer Lloyd Certification GmbH with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the CPA meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project is therefore recommended by Germanischer Lloyd Certification GmbH for registration.

The CPA applies the methodology “Energy efficiency measures in thermal applications of non-renewable biomass” (AMS-II.G version 03^{2/}). The methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. By disseminating about **4 500** energy efficient ICS (a mix of **CH 2200**, **CH 2300** and **CH 4400**) during the **10 year** crediting period and thereby reducing the amount of Non-Renewable Biomass used in the project area in household for cooking, this first CPA in Ghana aims to reduce **154 770 tCO₂e** over the **10 year** crediting period, leading to a calculated annual average of **15 477 tCO₂e** emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

Given that the CPA is implemented as designed, it is likely to achieve the estimated amount of emission reductions.

It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.

No relevant negative environmental impacts are expected from the implementation of the project activity. Global and local stakeholder consultations were conducted.

In summary, it is GLC's opinion that the **African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)** as described in the revised project design document (CPA-DD, version 3) meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies AMS-II.G version 03. Hence, GLC requests the inclusion of the **African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)** as the first CPA under the PoA **African Improved Cooking Stoves Programme of Activities**.

Hamburg, 2012-12-05

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6 REFERENCES

The following table outlines the documentation reviewed during the validation:

Ref. No.	TITLE of DOCUMENT or EVIDENCE (Author, website link)	DATE (Issuance or signed / submission)
/1/	<p>PoA-DD: African Improved Cooking Stoves Programme of Activities version 1 CPA-DD: African Improved Cooking Stoves Programme of Activities – 0001(Ghana) ver 1 CPA-DD generic: African Improved Cooking Stoves Programme of Activities – #####(Country) ver 1 http://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/TKUCI3AN3E122550AOL40YALO7IJWW/view.html CPA-DD: African Improved Cooking Stoves Programme of Activities – 0001(Ghana) ver 3.2 CPA-DD: African Improved Cooking Stoves Programme of Activities – 0001(Ghana) ver 3.2</p>	<p>23/11/2011</p> <p>27/11/2012</p>
/2/	AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass --- Version 3.0 http://cdm.unfccc.int/methodologies/DB/6U8JYO9XTLVZ8LJ7GUBSZP145BIDG2	EB60 valid from 29/04/2011
/3/	EB 65 Annex 3 PoA Standard and EB 70 Annex 5 http://cdm.unfccc.int/Reference/Standards/meth/meth_stan04.pdf	EB 70 Annex 5 EB 65, Annex 3 25 November 2011
/4/	Clarification Regarding the Procedures for Registration of a PoA as a single CDM Project Activity and Issuance of CERs for a PoA, version 01. (EB 60, Annex 26) http://cdm.unfccc.int/Reference/Guidclarif/PoA/poa_guid06.pdf	15 April 2011
/5/	Guidelines on Assessment of De-bundling for SSC Project Activities, version 03 (EB 54, Annex 13) http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid17.pdf	28 May 2010
/6/	Clean Development Mechanism Verification and Validation Manual (version 01.2) http://cdm.unfccc.int/UserManagement/FileStorage/18Y54N6CWUV2LOESXQP3RMBID9FHK	EB 55 30 July 2010
/7/	Standard for sampling and surveys for CDM project activities and Programme of Activities (EB65 annex 2) http://cdm.unfccc.int/Reference/Standards/meth/meth_stan05.pdf	25/11/2011
/8/	Sustainable Energy in Sub-Saharan Africa http://www.icsu.org/icsu-africa/publications/reports-and-reviews/icsu-roa-science-plan-on-sustainable-energy/Doc%20SP02.1 ICSU%20ROA%20Science%20Plan%20-%20Sustainable%20Energy.pdf	July 2007
/9/	“Guidelines for demonstrating additionality of microscale project activities” (Version 03) http://cdm.unfccc.int/filestorage/WV/I/WV13RN692YMCGLZT40QXBOUA8H5KFP/eb63_repan23.pdf?t=b2h8bHpzOWdqfDB2-ID2BV4EAnRMOgncl20	EB 63 September 29, 2011
/10/	Envirofit Product Overview. http://www.envirofit.org/images/products/pdf/Envirofit_Product_Overview.pdf	2011
/11/	ER-African Improved Cooking Stoves PoA_CPA1 Ghana.xlsx	November 2011
/12/	Distributing Organisation Responsibility Manual –Rev 2.0	January 2012
/13/	Emission and Performance Test Protocol. http://cdm.unfccc.int/filestorage/I/Z/X/IZX36AE84V1K5NOYQBSU0TWRHD2FGL/Stove%20Emi	

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/21/	GTZ Report on Charcoal in Africa: Importance, Problems and Possible Solution Strategies http://www.gtz.de/de/dokumente/gtz2008-en-charcoal-in-africa.pdf	April 2008
/22/	EB 63 Annex 2: 2011 Standard for demonstration of additionality of GHG emission reductions achieved by a Programme of Activities http://cdm.unfccc.int/UserManagement/FileStorage/53IL4CJH82EFWGVTPMOYANUSBX697R	29 September 2011
/23/	CONFIDENTIAL_Improved Cooking Stoves PoA in Africa_Confirmation Letter Shell.	16/11/2011
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/289/	Clarification on energy efficiency requirements for project cookstoves under AMS-II.G	submitted 12 Dec 2011
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/31/	National Action Programme to Combat Drought and Desertification Environmental Protection Agency Accra, Ghana http://www.unccd.int/actionprogrammes/africa/national/2002/ghana-eng.pdf	April 2002
/32/	Guidelines for sampling and surveys for CDM project activities and programme of activities (version 02.0) and Standard for Sampling and Surveys for CDM Projects Activities and PoAs version 3	EB 69 Annex 5 EB 69 Annex 4

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/44/	Envirofit_CEESD_Final_Contract_Signed_With CDM Annex	10/02/2012
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/59/	EB 68 to "Guidelines on the Demonstration of Additionality of Small Scale Project Activities" version 09	20/07/2012
/60/	Sample of Distribution Record (sales receipt)	January 2012
/61/	CDM Glossary of Terms version 7.0	EB 70 Annex 07

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**ANNEX A: VALIDATION QUESTIONNAIRE,
RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS
(FINDINGS'S LIST),
AND
ASSESSMENT ON CPA COMPLIANCE AGAINST INCLUSION ELIGIBILITY CRITERIA**

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TABLE 1: Validation Questionnaire

CHECKLIST QUESTION / VVM AND POA REQUIREMENTS		SOURCE	MEANS AND FINDINGS OF VALIDATION (BASED ON GSC VERSION OF THE CPA-DD)	ASSESS MENT	FINAL CON.
A. GENERAL DESCRIPTION OF SMALL SCALE CDM PROJECT ACTIVITY (SSC-CPA)					
A.1 Title of the SSC-CPA					
A.1.1	Are title, current version number and the date of document completion given in section A.1 of the real case CPA-DD? Does the CPA title also refer to a unique CPA No., e.g., CPA1-xxx?	EB 33 Annex 44	Yes. The title is given as "African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)" , completed on 23/11/2011 and the version number is 1.0. The unique CPA No. is 00001. Project documentation for GSC can be found at: http://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/L5NM3ZT1NP8125Z00TJ5E6XNLZ3MIV/view.html	OK	OK
A.1.2	Has the exact name/title of the PoA been included in the header of the CPA-DD form?	EB 33 Annex 44	Yes, the exact title of the PoA has been indicated as "African Improved Cooking Stoves Programme of Activities" as required	OK	OK
A.1.3	Has the latest version of the CDM-SSC-CPA-DD form been applied?	EB 55 Annex 1 § 55	Yes, the latest version, i.e. version 01 of the CDM-SSC-CPA-DD form been applied as found at UNFCCC website http://cdm.unfccc.int/Reference/PDDs_Forms/PoA/index.html	OK	OK
A.2 Description of the SSC-CPA					
A.2.1	Is the description of the CPA consistent between PoA-DD (section A.2 and A.4.2.1) and the generic CPA-DD (section A.2)?	EB 55 Annex 38, §15(d)	Yes, the description is consistent in all the documents	OK	OK
A.2.2	Has it been stated in a clear, accurate and complete manner which technology or measures are to be employed by the CPA?	EB 55 Annex 38 § 6 (f), EB 55 Annex 1 § 58	Yes, the CPA shall involve the replacement of low energy efficient cooking methods/regimes with more or better energy efficient Improved Cooking Stoves (ICS) in the project area. The widespread distribution of ICS shall reduce the demand and utilization of non-renewable woody biomass and therefore would lead to a reduction of GHG emissions.	OK	OK

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CHECKLIST QUESTION / VVM AND POA REQUIREMENTS		SOURCE	MEANS AND FINDINGS OF VALIDATION (BASED ON GSC VERSION OF THE CPA-DD)	ASSESS MENT	FINAL CON.
A.2.3	Is this description in accordance with the real situation or, in case of Greenfield CPAs, is it most likely that the CPA will be implemented according to the description?	EB 55 Annex 1, §§63, 64	As stated in the CPA-DD "The proposed CPA is a voluntary action undertaken by the Coordinating/Managing Entity (CME), Envirofit International Ltd (Envirofit), a company based in the United States of America, and carried out by Centre for Energy, Environment and Sustainable Development (CEESD), the Distributing Organisation (DO), a company based in Ghana." GLC is convinced the CEESD , a domestic company, is well equipped to implement the CPA as described in the CPA-DD.	OK	OK
A.2.4	In case the CPA involves alteration of the existing installation or process, is a clear description available regarding the differences between the proposed CPA and the pre-project situation?	EB 55 Annex 1, §§63, 64	The situation existing prior to the implementation of the project activity is the use of low energy efficient cooking methods/regimes while the project activity intends to replace this with more or better energy efficient Improved Cooking Stoves (ICS) in the project area. From the Stove Certification Sheet provided fuel consumption efficient for all brands of the ICS ranges from 30% to 50% and Thermal efficiency ranges from 30% to 85% according to Emission and Performance Test Protocol (Biomass stove performance and development of an improved testing protocol) developed by Colorado State University. The protocol is also found on UNFCCC website at Emission and Performance Test Protocol	OK	OK
A.3 Entity/Individual responsible for the CPA					
A.3.1	Does the specific case CPA-DD include information, e.g., name/contact details of the entity/individual responsible for the operation of the CPA, hence forth referred as CPA implementer(s)? Please describe this entity/individual responsible for the CPAs and steps taken to verify the information.	EB 55 Annex 38, §7 (a)	The entity responsible for the proposed CPA is Centre for Energy, Environment and Sustainable Development (CEESD), based in Accra, Ghana (details included in Annex 1 of CPA-DD). CEESD is the Distributing Organisation (DO) and is not a registered project participant in the PoA. During the onsite visit CEESD presented its registration certificate. GLC is therefore confident that CEESD is able to implement the CPA as described in CPA-DD	OK	OK
A.3.2	In case the CPA implementers are also project	EB 55	CEESD is not an approved project participant according to EB 55 Annex 38		

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	participants of the PoA, are their names included in the PoA? <i>The operators of individual CPAs are not required to be project participants. CDM programme participation is only recorded at the PoA level.</i>	Annex 38, §8	Procedure for registration of a programme of activities as a single project activity version 4.1 “The operators of individual CPAs are not required to be project participants. CDM programme participation is only recorded at the PoA level” and as such not included in PoA-DD.	OK	OK
A.3.3	Has contact information on entity/ individual responsible for the CPA been sufficiently and appropriately included in Annex 1 of the CPA-DD and consistent with section A.3 of the same? <i>Each organisation listed in section A.3 shall include the following mandatory fields: Organization, Name of contact person, Street, City, Postfix/ZIP, Country, Telephone and Fax or e-mail.</i>	EB 55 Annex 1, § 52	Centre for Energy, Environment and Sustainable Development contact information does include the organization, Name of contact person, City, post box, Country, Telephone and Fax or e-mail as required. However, Envirofit International Ltd contact information, as the CME for the CPA has not been included in Annex 1.	CAR1	OK
A.4 Technical Description of the CPA					
A.4.1 Identification of the SSC-CPA					
A.4.1.1	Are all host parties included in the specific case CPA-DD consistent with section A.4.1.1 of the PoA-DD?	EB 55 Annex 38, §7 (b)	Yes. The host party for this CPA is Ghana and this is consistent with section A.4.1.1 of PoA-DD	OK	OK
A.4.1.2	Does the specific case CPA-DD include correct geographical reference or other means of unique identification of a CPA? In case of GPS Coordinates, Decimal Degree formats should be given, e.g., Latitude: dd.mmmmm, Longitude: dd.mmmmm. <i>In case of stationary CPA, geographic reference should be used; in case of mobile CPAs, registration number, GPS devices, etc. should be used.</i>	EB 55 Annex 38, §7(a)	The CPA will be located in Ghana and its boundary shall be determined by the location of the individual households in Kumasi where the ICSs are distributed and is limited to the territorial area of the host country, Ghana. However, no GPS coordinates (in decimal format) have been provided	CAR2	OK
A.4.1.3	How is it ensured and/or demonstrated, that the project proponents can implement the project at the proposed site (ownership, licenses, contracts etc.)?	Local knowledge	The CPA implementer Centre for Energy, Environment and Sustainable Development (CEESD) is a well established company in Kumasi, Ghana. During the onsite visit CEESD presented its registration certificate. GLC is	OK	OK

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			therefore convinced that CEESD will be able to implement the CPA as described in CPA-DD		
A.4.1.4	Has it been demonstrated that the CPA is within the geographical borders of the PoA?	EB 55 Annex 38, §7(a)	Yes Ghana is one of the many countries envisaged to host a CPA under this PoA.	OK	OK
A.4.2 Duration of the SSC-CPA: Starting Date and Expected Operational Lifetime of the SSC-CPA					
A.4.2.1	Does the specific case CPA-DD include provisions that the start date can be clearly defined and evidenced? <i>Apply the definition as per the "Glossary of CDM terms".</i>	EB 55 Annex 1, §99	The CPA start date has been indicated as 01/02/2012 which is after the start of GSP on 12/12/2011 . The start date is defined by the start of ICS distribution. The start is therefore correctly defined according to version 06 of Glossary of CDM terms	OK	OK
A.4.2.2	Does the specific case CPA-DD include a confirmation that the start date of any CPA is not prior to the PoA validation commencement, i.e. the date on which the CDM-POA-DD is first published for global stakeholder consultation? <i>Otherwise please refer to EB47 Report Para72</i>	EB 55 Annex 38 §7(d); EB47 Report Para72	Yes. As indicated in the list of Eligibility Criteria the start date shall be after the PoA validation start date.	OK	OK
A.4.2.3	Does the the CPA include provisions to ensure that the operational lifetime can be clearly defined and evidenced? <i>Check whether the project lifetime can be clearly defined. Consider the guidance on the assessment of investment analysis (annex to the additionality tool). Check in case of phased implementation this has been reflected throughout the whole PDD incl. the financial assessment, if applicable.</i>	EB55 Annex 38 para7(d)	The expected operational lifetime of the SSC-CPA has been indicated as 21 years. Though ICS lifetime is shorted than 21 years, this can be acceptable since broken and dysfunctional stoves shall be replaced by CPA implementers in the course of the crediting period.	OK	OK
A.4.3 Choice of the Crediting Period: Starting Date and Length of the Crediting Period					
A.4.3.1	Does the specific case CPA-DD address the appropriate starting date of the crediting period of the CPA in DD/MM/YYYY format? <i>The starting date of a crediting period of the CPA shall be the date of its inclusion in the registered PoA or any date thereafter.</i>	EB 55 Annex 38, §7(c)	Yes, the start date of the crediting period in the DD for GSC has been correctly indicated as 01/07/2012, and this is the expected date of inclusion of the CPA under the PoA.	OK	OK

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<p>A.4.3.2 Does the specific case CPA-DD include the option to choose the type (fixed or renewable) and duration of the crediting period of the CPA?</p> <p><i>Taking into account that the duration of the crediting period shall not exceed the end date of the PoA.</i></p>	EB 55 Annex 38, §7(c)	Yes. PP has opted for a 10 year fixed crediting period.	OK	OK
A.4.4 Estimated amount of Emission Reductions over the chosen Crediting Period				
<p>A.4.4.1 Does the specific case CPA-DD include the estimated amount of emission reductions over the chosen crediting period (1st CP if renewable) of the CPA?</p>	EB 55 Annex 38, §7	Yes. The estimated emission reductions over the first crediting period has been indicated as 11 030 tCO ₂ e. This is same as the result obtained in the ER calculation assuming 4500 ICS in operation in order to maintain the microscale threshold.	OK	OK
A.4.5 Public Funding of the CPA				
<p>A.4.5.1 Does the specific case CPA-DD include information regarding public funding of the CPA, and consistent with section A.4.5 of the PoA-DD?</p> <p><i>In the real case CPA-DD, a table template without exact ER amount shall be included, nonetheless, fixed information throughout the entire PoA duration/ CPA crediting period can be also included.</i></p>	EB 55 Annex 38, §6(n))	It is indicated in A.4.5 of CPA-DD that “No public funding or ODA was diverted for the implementation of the CPA.” However clarification is requested regarding the source of funds for this CPA.	CL1	OK
<p>A.4.5.2 Has any important Public Funding information been included in Annex 2 of the CPA-DD and consistent with section A.4.5 of the CPA-DD?</p> <p><i>Assess information from Parties included in Annex 1 on sources of public funding for the project activity which shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties.</i></p>	EB 55 Annex 38, §6(n)	No other important funding information is included in Annex 2. See CL1	See CL1	OK
A.4.6 Information to confirm the CPA is not a De-bundled Component				
<p>A.4.6.1 Does the specific case CPA-DD include information to confirm that the proposed small-scale CPA is not a de-bundled component?</p> <p><i>Refer to the guidance for determining the occurrence of de bundling under a</i></p>	EB 54, Annex 13	CPAs of PoA are exempted from performing de-bundling check, i.e. considered as being not a de-bundled component of a large scale activity since according to the energy saving calculations, energy savings per ICS is about 12 MWh/year, which far below the 1.8 GWhth/year threshold. Each CPA is	OK	OK

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<i>programme of activities</i>		therefore exempted from performing de-bundling test as per EB 54, Annex 13, par. 10		
A.4.7 Confirmation that CPA is neither registered as an individual CDM or is part of another Registered PoA				
A.4.7.1 Does the specific case CPA-DD include provisions for a confirmation that the CPA is neither registered as a CDM project activity nor included in another registered PoA? <i>Make sure that each single subsystem of the CPA, e.g., solar cooker, bio-digester, etc. is not registered as part of a CDM project or included in another registered PoA.</i> <i>Make sure that no double counting of any emission reductions will occur.</i>	EB 55 Annex 38, §7(h)	Yes. In A.4.7 it is stated “ <i>The CPA is neither registered as an individual CDM project activity nor is it part of another registered PoA. All ICS units distributed under this CPA are uniquely identifiable by a serial number and can be located on the basis of the information that will be collected and maintained by the CME.</i> ” Examples of Stoves with serial numbers were presented to the GLC audit team during the site visit.	OK	OK
A.4.7.2 Are there provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA?	EB 55 Annex 38, §6(i)	PP has indicated in Eligibility Criteria No. 9 that there is a contractual agreement between the CPA implementers and the CME to ensure that the project will run uninterrupted and that CPA implementers are aware that their CPAs are part of a PoA and that they waive their rights to CER to the CME	OPEN	OK
B. ELIGIBILITY OF CPA AND ESTIMATION OF EMISSION REDUCTIONS				

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B.1 Title and Reference of the Registered PoA to which CPA is added				
B.1.1 Has the exact name/title, version No. and date of the final PoA-DD been consistently included in section B.1 of the specific case CPA-DD form? <i>Please ensure that the latest version number and date of the PoA-DD that is to be submitted for request for registration has been consistently included/updated in the specific case CPA-DD.</i>		The title has been indicated as “Improved Cooking Stoves Programme of Activities in Africa” However, the version number and date of the final PoA-DD are missing in the CPA-DD	CAR3	OK
B.2 Justification of why CPA is Eligible to be Included in the Registered PoA				
B.2.1 Has the specific case CPA-DD included justifications with evidences on how each CPA will fulfill the eligibility criteria specified in section A.4.2.2 of the PoA-DD? <i>Complete assessments on CPA compliance with the Inclusion Eligibility Criteria are included in Table 3.</i>	EB 55 Annex 38, §7(e)	Yes PP has included justification of Eligibility Criteria in CPA-DD. However, the minimum eligibility Criteria according to EB 65 Annex 3 § 14 PoA Standard has not been met by the Eligibility Criteria presented in A.4.2.2 of PoA-DD and applied in B.2 of CPA-DD. Supporting documents should also be provided	CAR4	OK
B.3 Assessment and Demonstration of Additionality of the CPA, as per Eligibility Criteria listed in the Registered PoA				
B.3.1 Does the specific case CPA-DD include information how each CPA will demonstrate additionality as specified in section E.5 of the PoA-DD? <i>Including, as appropriate, the demonstration of the additionality of the CPA.</i>	EB 55 Annex 38, §7(e)	Yes. According to EB 65 Annex 3 PoA Standard : PoAs that consist of one or more microscale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of EB 63, Annex 23 “Guidelines for demonstrating additionality of microscale project activities” The CPA size is below 60 GW _{th} / year and according to the energy saving calculations, energy savings per ICS (the independent subsystem) is about 12 MWh/year, which far below the 1.8 GWhth/year threshold. The end users of the	OK	OK

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		subsystems (ICS) are households.		

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B.4 Description of the Sources and Gases included in the Project Boundary and proof that the CPA is located within the geographical boundary of the PoA				
B.4.1 Does the specific case CPA-DD include information regarding sources and gases included in the CPA boundary and proof that the CPA will be located within the geographical boundary of the PoA?	EB 55 Annex 38, §7(a)	Yes. The CPA will be implemented in Ghana which is within the boundary of the PoA. The main GHG associated with this CPA and included in the project boundary is CO ₂ from the consumption of non-renewable woody biomass.	OK	OK
B.4.2 Has any important Baseline information necessary to be included in Annex 3 of the CPA-DD and consistent with section E.4 of the PoA-DD? <i>Assess any further background information used in the application of the baseline methodology. This may include tables with time series data, documentation of measurement results and data sources, etc.</i>	EB 55 Annex 1, §§ 67 (b), 82, §§ 104 – 106	Yes. Household biomass consumption values has been presented in Annex 3 and cross checked with information provided by the following Energy Enterprise Learning Platform -Ghana which indicates that “As of 2001 the rate of deforestation of Ghana's forest was 740,000 hectares per year (1.7% annual deforestation rate).” TED Case Study – Ghana Forest Loss which states “Since 1981, the annual rate of deforestation in Ghana has been two percent/year or 750 hectares each year. Ghana's tropical forest area is now just 25 percent of its original size” Also information and data used in the calculation of f _{NRB} has been provided and cross checked with information available a Ghana Forest Information and Data which states “Change in Forest Cover: Between 1990 and 2010, Ghana lost an average of 125,400 ha or 1.68% per year. In total, between 1990 and 2010, Ghana lost 33.7% of its forest cover or around 2,508,000 ha.” Nation Action Program to Combat Drought and Desertification which states “With increasing urbanization the demand for the mix of fuelwood and charcoal will grow in favour of charcoal. Per capita consumption of charcoal and fuelwood is estimated as 0.43-0.46 and 1.43 kg/person/day respectively. The figures in Table 14 show that fuelwood use will grow at the rate of 2.5%, charcoal 5% per annum”	OK	OK

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B.5 Emission Reductions						
B.5.1 Data and Parameters Available at Validation						
B.5.3.1 Parameter Title: Q_{biomass} Estimate of average annual consumption of woody biomass per appliance (tonnes/year)	AMS-II.G;	Parameter / Data Checklist		YES / NO /NA	OK	OK
		Title in line with methodology?		Yes		
		Data unit correctly expressed?		Yes		
		Appropriate description of parameter?		Yes		
		If default is the sourced correctly referenced?		Yes		
		If ex-ante determined, are data sources and assumptions appropriate and calculations correct?		Yes		
		If monitored, is the estimation reasonable?		NA		
		Comments: A value of 4.36 Tonnes/year has been applied. This is based on the calculation that average charcoal consumption per household is 726 kg/year.				
B.5.3.2 Parameter Title: $f_{NRB,y}$ Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass	AMS-II.G;	Parameter / Data Checklist		YES / NO /NA	CAR6	OK
		Title in line with methodology?		Yes		
		Data unit correctly expressed?		NA		
		Appropriate description of parameter?		Yes		
		If default is the sourced correctly referenced?		Yes		
		If ex-ante determined, are data sources and assumptions appropriate and calculations correct?		Yes		
		If monitored, is the estimation reasonable?		NA		

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CHECKLIST QUESTION / VVM AND POA REQUIREMENTS	SOURCE	MEANS AND FINDINGS OF VALIDATION (BASED ON GSC VERSION OF THE CPA-DD)	ASSESS MENT	FINAL CON.														
		Comments: The value of 0.68 has been applied. The calculation method has been checked and the source of the data is publicly available FAO FRA data on Ghana and this agrees with information found at Ghana Forest Information and Data . It is also worth mentioning that this is a very conservative figure compared to the 3 rd party calculated figure of 73 % (0.73) applied in Improved Household Charcoal Stoves in Ghana . However see CAR6																
B.5.3.3 Parameter Title: $NCV_{biomass}$ Net calorific value of the non- renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>Yes</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NA</td></tr></table> Comments: Default of 0.015 TJ/tonne has been applied as prescribed by the methodology	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	If default is the sourced correctly referenced?	Yes	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	NA	OK	OK
Parameter / Data Checklist	YES / NO /NA																	
Title in line with methodology?	Yes																	
Data unit correctly expressed?	Yes																	
Appropriate description of parameter?	Yes																	
If default is the sourced correctly referenced?	Yes																	
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																	
If monitored, is the estimation reasonable?	NA																	
B.5.3.4 Parameter Title: $EF_{projected_fossilfuel}$																		

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		assumptions appropriate and calculations correct?																	
		If monitored, is the estimation reasonable?	NA																
		Comments: Default of 81.6 tCO₂ / TJ has been applied as prescribed by the methodology (0.5*96 + 0.25*71.5 + 0.25*63 = 81.6 tCO ₂ / TJ)																	
B.5.3.5 Parameter Title: η_{old} : Efficiency of the system being replaced, measured using representative sampling methods or based on referenced literature values (fraction/efficiency)	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>Yes</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NA</td></tr></table>	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	If default is the sourced correctly referenced?	Yes	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	NA		CL2	OK
Parameter / Data Checklist	YES / NO /NA																		
Title in line with methodology?	Yes																		
Data unit correctly expressed?	Yes																		
Appropriate description of parameter?	Yes																		
If default is the sourced correctly referenced?	Yes																		
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																		
If monitored, is the estimation reasonable?	NA																		
		Comments: Default value of 0.1 has been applied as prescribed by the methodology. However, the onsite visit revealed that there has been some degree of penetration of ICS in Ghana. Different varieties of stoves were found in the households of potential end users. Some with efficiencies comparable to three-stones while others were very low efficient ICS. Given that many of the end users would also wish to replace their stoves with Envirofit stoves, 0.1 or 10% does not seem appropriate and does require some clarifications.																	
B.5.3.6 Parameter Title: η_{new} : Efficiency of the system being deployed as part of the project activity (fraction/efficiency)	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>NO</td></tr><tr><td>Data unit correctly expressed?</td><td>NO</td></tr><tr><td>Appropriate description of parameter?</td><td>NO</td></tr></table>	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	NO	Data unit correctly expressed?	NO	Appropriate description of parameter?	NO		CL3	OK						
Parameter / Data Checklist	YES / NO /NA																		
Title in line with methodology?	NO																		
Data unit correctly expressed?	NO																		
Appropriate description of parameter?	NO																		

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			<table><tr><td>If default is the sourced correctly referenced?</td><td>NO</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NO</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NO</td></tr></table>	If default is the sourced correctly referenced?	NO	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NO	If monitored, is the estimation reasonable?	NO										
If default is the sourced correctly referenced?	NO																		
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NO																		
If monitored, is the estimation reasonable?	NO																		
			Comments: Clarification is requested as to why the efficiency of the system being deployed has not been included in section E.6.3 of PoA-DD.																
B.5.3.7	Parameter Title LAF : Net to gross Adjustment Factor of 0.95 to account for Leakages	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>Yes</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NA</td></tr></table>	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	If default is the sourced correctly referenced?	Yes	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	NA	OK	OK
Parameter / Data Checklist	YES / NO /NA																		
Title in line with methodology?	Yes																		
Data unit correctly expressed?	Yes																		
Appropriate description of parameter?	Yes																		
If default is the sourced correctly referenced?	Yes																		
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																		
If monitored, is the estimation reasonable?	NA																		
			Comments: Default value of 0.95 has been applied as prescribed by the methodology (LAF = Leakage Adjustment Factor).																
B.5.3.8	Is the list of parameters presented in chapter E.6.3 considered to be complete with regard to the requirements of the applied methodology?	AMS-II.G;	No. See CL3		See CL3	OK													

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CHECKLIST QUESTION / VVM AND POA REQUIREMENTS		SOURCE	MEANS AND FINDINGS OF VALIDATION (BASED ON GSC VERSION OF THE CPA-DD)	ASSESSMENT	FINAL CON.
B.5.3.9	Are all data and parameters in section B.5.1 of the specific case CPA-DD consistent with section E.6.3 of the PoA-DD?	EB 55 Annex 38, §15(d)	See CL3	See CL3	
B.5.2 Ex-ante Calculation of Emission Reductions					
B.5.3.1	Are CPA-specific conservative assumptions used and uncertainties addressed when calculating the baseline emissions, project emissions and leakage emissions?	EB55 Annex38 § 6(g) & 7(e(ii))	<p>The baseline emissions avoided, which correspond to the emission reduction achieved by the implementation of a typical CPA is calculated using the equation below.</p> $ER_y = B_{y,savings} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$ <p>Default values for NCV and EF have been applied correctly as per the methodology.</p> <p>$f_{NRB,y}$ has been calculated using publicly available FAO FRA data on Ghana and information data on Ghana found at Ghana Forest Information and Data.</p> <p>Quantity of woody biomass that is saved in tonnes $B_{y,savings}$ has been calculated from estimate of average annual consumption of woody biomass per appliance $Q_{biomass}$ (tonnes/year) multiplied by the number of appliance (N). The parameter $Q_{biomass}$ has been conservatively approximated as 4.36 Tonnes/year based on the calculated average charcoal consumption per household of 726 kg/year.</p> <p>However, CAR6</p>	See CAR6	OK
B.5.3.2	Are all information in section B.5.2 of the specific case CPA-DD consistent with section E.6.2 of the PoA-DD?	EB 55 Annex 38, §15(d)	Yes. The emission reductions calculation approach is consistent with E.6.2 of PoA-DD	OK	OK

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B.5.3 Summary of the Ex-ante Estimation of Emission Reductions																			
B.5.3.1	Does the specific case CPA-DD include a table of summary on the estimated amount of emission reductions over the chosen crediting period, incl. annual and total, of the CPA? <i>In the real case CPA-DD, a table template without exact ER amount shall be included, nonetheless, fixed information throughout the entire PoA duration/.CPA crediting period can be also included.</i>	EB 55 Annex 38, §7	Yes. A summary table of emission reduction has been provided	OK	OK														
B.6 Application of the monitoring methodology and description of monitoring plan																			
B.6.1 Description of the Monitoring Plan (Data and Parameter to be Monitored)																			
B.6.1.1	Parameter Title: η_{new} : Annual check of the efficiency of all appliances deployed as part of the project activity (fraction) [or a representative sample thereof, at least once every two years (biennial)]	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>NA</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>Yes</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>Yes</td></tr></table> Comments: A value of 34.8% has been applied in estimating the emission reduction. This is based on a '50/50' deployment of CH 4400 and CH 2200 stove model. According to Emissions and Performance Report for CH 2200	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	If default is the sourced correctly referenced?	NA	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	Yes	If monitored, is the estimation reasonable?	Yes	See CL3	OK
Parameter / Data Checklist	YES / NO /NA																		
Title in line with methodology?	Yes																		
Data unit correctly expressed?	Yes																		
Appropriate description of parameter?	Yes																		
If default is the sourced correctly referenced?	NA																		
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	Yes																		
If monitored, is the estimation reasonable?	Yes																		

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			its average thermal efficiency is 38.2%. Average thermal efficiency for CH 4400 is 31.4%. For other stove models specification can be obtained at Envirofit Product Overview . However see CL3																	
B.6.1.2	Parameter Title: N_{all}: Total number of stoves installed. Checking of all appliances or a representative sample thereof, at least once every two years (biennial) to determine if they are still operating or are replaced by an equivalent in service appliance.	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>NA</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>Yes</td></tr></table> Comments: The value 4500 indicated is required to maintain that the scale of the project activity does not go beyond the micro-scale project activity threshold.		Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	Yes	Data unit correctly expressed?	NA	Appropriate description of parameter?	Yes	If default is the sourced correctly referenced?	NA	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	Yes	OK	OK
Parameter / Data Checklist	YES / NO /NA																			
Title in line with methodology?	Yes																			
Data unit correctly expressed?	NA																			
Appropriate description of parameter?	Yes																			
If default is the sourced correctly referenced?	NA																			
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																			
If monitored, is the estimation reasonable?	Yes																			
B.6.1.3	Parameter Title: SOF Stove Operation Fraction. [Used to determine stoves that are still operating, measured ex-post through survey/ user feedback]	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>NO</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>NO</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>Yes</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>Yes</td></tr></table>		Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	NO	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	If default is the sourced correctly referenced?	NO	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	Yes	If monitored, is the estimation reasonable?	Yes	CL4	OK
Parameter / Data Checklist	YES / NO /NA																			
Title in line with methodology?	NO																			
Data unit correctly expressed?	Yes																			
Appropriate description of parameter?	Yes																			
If default is the sourced correctly referenced?	NO																			
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	Yes																			
If monitored, is the estimation reasonable?	Yes																			

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			Comments: This parameter is not explicitly mentioned in the applied methodology. Clarification is required from PP concerning the parameter and the appropriateness of the value of 1 indicated in the CPA-DD																	
B.6.1.4	Parameter Title: Fuel Consumption during the the project activity. If the quantity of fuel saved is determined using the Kitchen Performance Test (i.e. paragraph 6, Option 1 of AMS-II.G version 03), monitoring shall ensure that this is monitored annually.	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>NA</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NA</td></tr></table>	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	If default is the sourced correctly referenced?	NA	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	NA		OK	OK
Parameter / Data Checklist	YES / NO /NA																			
Title in line with methodology?	NA																			
Data unit correctly expressed?	NA																			
Appropriate description of parameter?	NA																			
If default is the sourced correctly referenced?	NA																			
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																			
If monitored, is the estimation reasonable?	NA																			
			Comments: PP has not chosen this option																	
B.6.1.5	Parameter Title: B_{old} Quantity of woody biomass used in the absence of the project activity in tonnes. [If option (b) in paragraph 7 of AMS-II.G version 03 is chosen for determining B_{old} , monitoring shall include the amount of thermal energy generated by the project technology t in year y]	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>NA</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NA</td></tr></table>	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	If default is the sourced correctly referenced?	NA	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	NA		OK	OK
Parameter / Data Checklist	YES / NO /NA																			
Title in line with methodology?	NA																			
Data unit correctly expressed?	NA																			
Appropriate description of parameter?	NA																			
If default is the sourced correctly referenced?	NA																			
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																			
If monitored, is the estimation reasonable?	NA																			
			Comments: PP has not chosen this option																	
B.6.1.6	Parameter Title: Amount of woody biomass saved under the project activity that is used by non-project households/users (who previously used	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr></table>	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	NA		OK	OK										
Parameter / Data Checklist	YES / NO /NA																			
Title in line with methodology?	NA																			

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renewable energy sources or Use or increase use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities). [In order to assess the leakage, monitoring shall include this parameter. Other data on non-renewable woody biomass use required for leakage assessment shall also be collected.]			Data unit correctly expressed? NA Appropriate description of parameter? NA If default is the sourced correctly referenced? NA If ex-ante determined, are data sources and assumptions appropriate and calculations correct? NA If monitored, is the estimation reasonable? NA			
			Comments: PP has opted to account for leakage by applying the 0.95 Net-to-gross Adjustment Factor (LAF) as provided by the methodology			
B.6.1.7	Parameter Title: Disposal of low efficiency appliance. [Either the replaced low efficiency appliances are disposed of and not used within the boundary or within the region]	AMS-II.G;	Parameter / Data Checklist Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA If default is the sourced correctly referenced? NA If ex-ante determined, are data sources and assumptions appropriate and calculations correct? NA If monitored, is the estimation reasonable? NA		OK	OK
			Comments: PP has opted to monitor continuous use of replaced stoves for it is not practicable to collect the replaced stoves or to ask the end users to dispose of them.			
B.6.1.8	Parameter Title: Fuel-wood Consumption due to continuous use of Baseline Stoves. [If baseline stoves continue to be used, monitoring shall ensure that the fuel-wood consumption of those stoves is excluded from B_{old} .]	AMS-II.G;	Parameter / Data Checklist Title in line with methodology? Yes Data unit correctly expressed? Yes Appropriate description of parameter? Yes If default is the sourced correctly referenced? NA		CL5	OK

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			<table><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NO</td></tr></table>	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	NO													
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																			
If monitored, is the estimation reasonable?	NO																			
			Comments: The methodology does not prescribe any default value and the value of zero applied by the PP does not have any reference. For ex-ante estimation of ER zero cannot be considered conservative considering that some end users would still be using their old appliances in parallel with the new ones. Clarification is request for the appropriateness of this estimated value of zero																	
B.6.1.9	Parameter Title: Amount of thermal energy generated by the project technology in year y. [If option (b) in paragraph 7 of AMS-II.G version 03 is chosen for determining B_{old}]	AMS-II.G;	<table><tr><th>Parameter / Data Checklist</th><th>YES / NO /NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>If default is the sourced correctly referenced?</td><td>NA</td></tr><tr><td>If ex-ante determined, are data sources and assumptions appropriate and calculations correct?</td><td>NA</td></tr><tr><td>If monitored, is the estimation reasonable?</td><td>NA</td></tr></table>	Parameter / Data Checklist	YES / NO /NA	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	If default is the sourced correctly referenced?	NA	If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA	If monitored, is the estimation reasonable?	NA		OK	OK
Parameter / Data Checklist	YES / NO /NA																			
Title in line with methodology?	NA																			
Data unit correctly expressed?	NA																			
Appropriate description of parameter?	NA																			
If default is the sourced correctly referenced?	NA																			
If ex-ante determined, are data sources and assumptions appropriate and calculations correct?	NA																			
If monitored, is the estimation reasonable?	NA																			
			Comments: PP has not chosen this option																	

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B.6.1.10 Are all monitoring parameters and relevant information in the real case CPA-DD consistent with section E.7.1 of the PoA-DD and with regard to the requirements of the applied methodology?	EB 55 Annex 38, §15(d)	See CL4& 5	See CL4& 5	OK
B.6.1.11 Does the specific case CPA-DD include provisions to demonstrate the application of the baseline and monitoring methodology as described in the most updated PoA-DD?	EB55 Annex 38 § 7(e)	According to EB 65 Annex 3 § 14(e) PoA Standard compliance with applicability and other requirements of single or multiple methodology/ies and tools applied by CPAs has to be included in A.4.2.2 of PoA-DD as one of the minimum Eligibility Criteria. See PoA-CAR1d	See CAR1	OK
B.6.1.12 Is the monitoring plan described in the section B.6.1 of the specific case CPA-DD in accordance with the approved methodology and section A.4.4.2 and E.7.2 of the PoA-DD?	EB55 Annex38 § 6(g) & 7(e)(ii)	Yes, the monitoring plan as described in this CPA-DD is in accordance with that in the PoA-DD and it is in accordance with AMS-II.G and is “sufficient to ensure that the coordinating/managing entity will have control of all records and information related to the implementation of individual CPAs and will be in a position to ensure each CPA is being operated in accordance with the specific requirements of the programme” according to Validation and Verification Manual , paragraph 166,	OK	OK
B.6.1.13 Has any important Monitoring information necessary to be included in Annex 4 of the CPA-DD and consistent with section B.6 of the CPA-DD? <i>Assess any further background information used in the application of the monitoring methodology. This may include tables with time series data, additional documentation of measurement equipment, procedures, etc.</i>	EB 55 Annex 38, §6(j); EB 55 Annex 1 123 (b), 124	No further information has been included in Annex 4	OK	OK

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D ENVIRONMENTAL IMPACT ANALYSIS				
D.1 Level of Environmental Impact Analysis and Justification				
C.1.1 Has the specific case CDM-CPA-DD consistently justified the level of environmental analysis as per section C.1 of the PoA-DD?	EB 55 Annex 37, §7(f)	CME has indicated that EIA shall be conducted at PoA level. However, considering that CPAs under the PoA shall be implemented in different countries with different regulations and/laws on the environment, more explanation is required why EIA shall not be conducted at CPA level	CL6	OK
D.2 Documentation on Environmental Impact Analysis, including trans-boundary Impacts				
C.2.1 Has the specific case CDM-CPA-DD consistently provided information regarding environmental analysis as per section C.2 of the PoA-DD?	EB 55 Annex 37, §7(f)	See CL6	See CL6	OK
D.3 Environmental Impact Assessment requirement for a typical CPA				
C.3.1 Has the specific case CPA-DD consistently provided information regarding EIA as per section C.3 of the PoA-DD?	EB 55 Annex 37, §7(f)	See CL6	See CL6	OK

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D LOCAL STAKEHOLDERS' CONSULTATION AND COMMENTS				
D.1 Level of Local Stakeholders' Consultation and Justification				
<p>D.1.1 Has the real case CPA-DD consistently justified the level on which comments by local stakeholders shall be invited as per section D.1 of the PoA-DD?</p> <p><i>It is assessed whether stakeholders have been properly consulted in the development of the CPA. EB48 Annex29Para4(m)</i></p>	<p>EB 55 Annex 38, §7(g)</p>	<p>PP has stated in D.1 of PoA-DD that “<i>Since the PoA boundary consists of more than one host country, a local stakeholder consultation would need to be conducted once per host country participating in the PoA.</i>”</p> <p>However, the check box does not reflect this.</p> <p>Also no Local Stakeholder Consultation has been conducted at the CPA as indicated in the CPA-DD. This is inconsistent with the information in PoA-DD. Local stakeholder consultation prior to inclusion of the CPA, as one of the minimum Eligibility Criteria according to EB 65 Annex 3 § 14(e) PoA Standard, has also not been included in A.4.2.2 of PoA-DD</p>	<p>CAR5</p>	<p>OK</p>
D.2 Description how Local Stakeholders' Comments have been Invited and Compiled				
<p>D.2.1 Has the real case CPA-DD consistently provided information regarding how comments by local stakeholders will be invited as per section D.2 of the PoA-DD?</p>	<p>EB 55 Annex 37, §7(f)</p>	<p>See CAR5</p>	<p>See CAR5</p>	<p>OK</p>
D.3 Summary of the Comments Received				

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D.3.1	Has section D.3 of the real case CPA-DD sufficiently provided information regarding summary of comments received from local stakeholders?	EB 55 Annex 37, §7(f)	See CAR5	See CAR5	OK
D.4 Report on how Due Account was taken of any Comments Received.					
D.4.1	Has section D.4 of the real case CPA-DD sufficiently provided information regarding how due account was taken of any comments received?	EB 55 Annex 37, §7(f)	See CAR5	See CAR5	OK
ANNEX 3: PARAMETERS USED IN THE CALCULATION OF NON-RENEWABLE BIOMASS FRACTION FOR GHANA: $F_{NRB} = NRB / (NRB + DRB)$					
Parameter (Country-specific)			Data Source / Comments	ASSESS MENT	FINAL CON.
Nationally harvested Wood (Industrial roundwood and Woodfuel) in m ³ (H) = 25 288 000		Annex 3	FAO FRA 2010 , global tables, table 13: Trends in removals of wood products from 1990 - 2005. The most up-to-date values available. However, see CAR6 below	see CAR6	OK
Biomass Conversion and Expansion Factor for wood removal in ton/m ³ (BCEF _R) = 0.89		Annex 3	From IPCC 2006, Vol. 4, Table 4.5 , taking into account the growing stock per area of forest in the respective country, as reported in FAO FRA, table 10 .	OK	OK

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Quantity of woody biomass used in the absence of the project activity in ton/year ($B_y = H_{p,y} * BCEF_R$) = 22 506 320	Annex 3	Calculated from the above two parameters However, see CAR6 below	see CAR6	OK
Growth rate of biomass (appropriate default above-ground net biomass growth) in tonnes dry matter per hectare in Ghana per year y in tonne/ha (G_w) = 1.3	Annex 3	From IPCC 2006, Vol. 4, Table 4.9 The G_w corresponds to the IPCC climate zone of the host country, as shown in IPCC, Vol. 4, Figure 3 A.5.1.	OK	OK
Demonstrably sustainable conserved forest area in Ghana (that is within a protected area or has a management plan) in hectare in year y ($A_{forest,y}$) = 5 557 000	Annex 3	From FAO FRA 2010, global tables, table 6 : Forest management and legal status 2010	OK	OK
Demonstrably Renewable Biomass, tonnes ($DRB_y = G_w * A_{forest,y}$) = 7 224 100	Annex 3	This is the calculated total standing biomass which is accessible for fuel wood in Ghana	OK	OK
$NRB_y = B_y - DRB_y$ = 15 282 220	Annex 3	Calculated However, see CAR6 below	see CAR6	OK
$f_{NRB} = NRB / (NRB + DRB)$ = 0.68	Annex 3	The figure indicated in the CPA-DD is therefore reproducible. However, according to Trends in removals of wood products 1990-2005 in Ghana, harvested wood can either be industrial roundwood or woodfuel. Applying total harvest for industrial roundwood and for fuelwood in the calculation of f_{NRB} is therefore not conservative.	CAR6	OK

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Table 2 Resolution of Corrective Action and Clarification Requests including list of Forward Action Requests

Description of Findings by the Validation Team (CAR, CR, FAR) <i>Describe the finding in a transparent manner i.e. state clearly what is required and why; address the context (e.g. section)</i>	Project Participants Response <i>This section shall be filled by the PP. The finding shall be addressed with suitable arguments and evidence</i>	GLC Validation Team Assessment / Conclusion <i>The assessment shall include how the finding is closed i.e. how it is found that the response is assessed to be appropriate and meeting the specific requirement of the finding. In case the response is not satisfactory, additional response and DOE assessments (#2, #3, etc.) shall be sought.</i>	Final Conclusion (OK Closed Out / Not Closed out)
<u>CPA-CAR No. 1 (GLC on 06.02.2012)</u> Envirofit International Ltd. contact information, as the CME for the CPA has not been included in Annex 1.	<u>PP on 23.03.2012</u> CPA-DD has been amended to include the contact details for the CME, Envirofit International.	<u>GLC on 17.04.2012</u> The CPA-DD has been revised accordingly with full contact details of both the CPA implemeter and the CME included. The issue is therefore considered closed out.	OK Closed out
<u>CPA-CAR No. 2 (GLC on 06.02.2012)</u> The CPA will be located in Ghana and its boundary shall be determined by the location of the individual households in Kumasi where the ICSs are distributed and is limited to the territorial area of the host country, Ghana. However, no GPS coordinates (in decimal format) have been provided.	<u>PP on 23.03.2012</u> CPA-DD has been amended such that Section A.4.1.2 now includes GPS coordinates for Kumasi, which is where the headquarters of CEESD are located. In addition, a district map of Kumasi has been included to show the two districts where the ICS distribution will start. <u>PP on 11.05.2012 (2nd. Round)</u> Following the second round of comments, the	<u>GLC on 16.04.2012 (1st. Round)</u> The GPS coordinates provided is not in decimals. This CPA is exempted from performing de-bundling check as per EB 54, Annex 13, par. 10 Guidelines on Assessment of De-bundling for SSC Project Activities ^{/5/} , i.e. considered as being not a de-bundled component of a large scale activity since according to the energy saving calculations in ER-African Improved Cooking Stoves PoA_CPA1 Ghana ^{/11/} , energy savings per ICS is about 13 MWh_{th}/year , which far below the 1.8 GWh_{th}/year	

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Description of Findings by the Validation Team (CAR, CR, FAR) <i>Describe the finding in a transparent manner i.e. state clearly what is required and why; address the context (e.g. section)</i>	Project Participants Response <i>This section shall be filled by the PP. The finding shall be addressed with suitable arguments and evidence</i>	GLC Validation Team Assessment / Conclusion <i>The assessment shall include how the finding is closed i.e. how it is found that the response is assessed to be appropriate and meeting the specific requirement of the finding. In case the response is not satisfactory, additional response and DOE assessments (#2, #3, etc.) shall be sought.</i>	Final Conclusion (OK Closed Out / Not Closed out)
	coordinates for Kumasi (4.854, -2.084) have been provided in decimal format.	threshold (equivalent of 600 MWh ⁹⁾ . As such the distribution of ICS in the first CPA must not be limited to a particular region. GLC on 13.06.2012 (2nd. Round) GPS coordinate for Kumasi has been provided as required. This issue is therefore considered closed out	OK Closed out
CPA-CAR No. 3 (GLC on 06.02.2012) The version number and date of the final PoA-DD are missing in the CPA-DD	PP on 23.03.2012 The version number and date of both the PoA-DD and the CPA-DD have been corrected.	GLC on 17.04.2012 The PDDs have been revised accordingly to include version numbers and dates. This issue is therefore considered closed out.	OK Closed out

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<p><u>CPA-CAR No. 4 (GLC on 06.02.2012)</u></p> <p>The minimum eligibility Criteria according to EB 65 Annex 3 § 14 PoA Standard has not been met by the Eligibility Criteria presented in A.4.2.2 of PoA-DD and applied in B.2 of CPA-DD. Evidences should also be provided</p>	<p><u>PP on 23.03.2012</u></p> <p>The CPA-DD has been amended and is now in line with the redrafted eligibility criteria in the PoA-DD, which are in line with the PoA Standard. The following evidences have been provided to the DOE:</p> <ol style="list-style-type: none"> 1. Photograph of Stove ID number (included in CPA-DD) 2. Manufacturer's specifications for the two stove models to be distributed showing efficiencies (see additional proof 5) 3. Bill of Lading showing shipping date which is the start date of CPA (see additional proof 11) 4. Demonstration of fNRB calculation which is now included in Section B.5.2 of the CPA-DD 5. Emissions reduction spread sheet showing energy savings (see additional proof 1) 6. Statement of no ODA funding diversion from both Envirofit and Shell Foundation (see additional proof 17&18). 	<p><u>GLC on 17.04.2012 (1st. Round)</u></p> <p>The Eligibility Criteria have been revised and documental evidences have been provided as well. This, coupled with information gathered during the onsite visit, has provided sufficient information to convince GLC that the CPA fulfills the Eligibility Criteria as listed in the PoA-DD.</p> <p>However, the contract between the CME and the CPA implementer EAE does not ensure that:</p> <ul style="list-style-type: none"> ➤ The CPA has not been and will not be registered as a single CDM project activity or as a CPA under another PoA. ➤ The CPA implementer (DO) is aware that the CPA will be subscribed to this PoA ➤ The CPA implementer (DO) cedes its rights to claim and own emission reductions, under the Clean Development Mechanism of the UNFCCC or any voluntary scheme, to the CME of this PoA. ➤ The CPA implementer (DO) certifies that the CPA is not registered under the Clean Development Mechanism of the UNFCCC or any voluntary scheme. <p>Furthermore, the Eligibility Criteria do not include the following:</p> <ul style="list-style-type: none"> ➤ Conditions that ensure compliance with applicability and other requirements of single or 	
<p>Germanischer Lloyd Certification Code: DC-GHG 015_A, Rev.00 Date: 2012-02-24; MN, Cyf, Junw</p>	<p>7. Confidential copy of the contract between the CME and the CPA implementer (CEESD) (see additional proof 4)</p>	<p>Attention: This form is controlled electronically and shall only be printed out for use as a record</p>	<p>Page 65</p>

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<p><u>CPA-CAR No. 5 (GLC on 06.02.2012)</u></p> <p>PP has stated in D.1 of PoA-DD that “<i>Since the PoA boundary consists of more than one host country, a local stakeholder consultation would need to be conducted once per host country participating in the PoA.</i>” However, the check box does not reflect this. Also no Local Stakeholder Consultation has been conducted at the CPA as indicated in the CPA-DD. This is inconsistent with the information in PoA-DD. Local stakeholder consultation prior to inclusion of the CPA, as one of the minimum Eligibility Criteria according to EB 65 Annex 3 § 14(e) PoA Standard, has also not been included in A.4.2.2 of PoA-DD</p>	<p><u>PP on 23.03.2012</u></p> <p>The CPA-DD has been amended to include the results of the Local Stakeholder Consultation.</p> <p>The PoA-DD has also been amended to indicate that the approach to be taken is that the LSC will be undertaken for the first CPA in each country. The box has been ticked indicating that the LSC is undertaken at the CPA level.</p>	<p><u>GLC on 17.04.2012</u></p> <p>PP has revised the CPA-DD to include the results of the Local Stakeholder Consultation^[24] that was conducted on November 14, 2011 in Accra. In addition to the advert placed in the local Newspaper - The Ghana News Agency, invitation letters were sent to individuals, government officials, NGOs, Artisans and to local organisations. The 18 page report^[24] includes a full list of participants and photos. A sample text of the invitation sent to individual stakeholders as well as a sample of the published invitation has been included in the report. A manually signed list of over 60 participants has also been provided as part of the LSC Report^[24]. This issue is therefore considered closed out.</p>	<p>OK Closed out</p>
<p><u>CPA-CAR No. 6 (GLC on 06.02.2012)</u></p> <p>According to Trends in removals of wood products 1990-2005 in Ghana, harvested wood can either be industrial roundwood or woodfuel. Applying total harvest for industrial roundwood and for fuelwood in the calculation of f_{NRB} is therefore not conservative.</p>	<p><u>PP on 23.03.2012</u></p> <p>The CPA-DD has been amended to reflect a revised estimate of f_{NRB}. Reference is made to an application for clarification by another project participant on the issue of f_{NRB} calculation (http://cdm.unfccc.int/filestorage/Q/J/D/QJD2ISRE8K6OCXTGBYZ1P0MW7NA5U9/Final%20response.pdf?t)</p>	<p><u>GLC on 17.04.2012 (1st. Round)</u></p> <p>PP has provided a good argument in support of the approach taken to calculate f_{NRB} for Ghana. However, considering that CPAs shall also be implemented in LDCs, PP has not demonstrated that the approach to determine f_{NRB} would yield the same results as that used by CDM SSC WG as published at</p>	

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	<p>=TFJ8bTB6M2g1fDDJp5xrG6eLQgCn9lqLzG7Z) where it was clarified that only used biomass is considered in the calculation. The improved cooking stoves to be distributed as part of the CPA will reduce demand for fuelwood. It is therefore logical to focus on the biomass fuelwood consumption of households rather than total biomass harvest (industrial roundwood and fuelwood). In the revised approach, only woodfuel removals are considered as part of the harvest. Accordingly, the forest regrowth has also been corrected for the relative harvest of woodfuel. This is in line with the Mean Annual Increment (MAI) approach presented in the recent call for inputs of the UNFCCC CDM SSC WG (Report of its 33rd Meeting, Annex 8, Attachment B). A copy of this Annex is provided to the DOE for validation (see additional proof 19).</p> <p>The relevant literature for our argument has been included in the CPA-DD in Section B.5.2.</p> <p>The value for f_{NRB} has changed to 0.88.</p>	<p>http://cdm.unfccc.int/Panels/ssc_wg/index.html. Also, PP has not demonstrated that the approach would yield conservative values for f_{NRB} in both LDCs and non LDCs.</p> <p>GLC on 13.06.2012 (2nd. Round)</p> <p>PPs have conservatively adopted the approach in Information note: Default values of f_{NRB} for LDCs and SIDs^{/54/} of annex 20 of CDM-SSC WG 35th Meeting Report for the calculation of f_{NRB} considering only biomass used in household is considered and not the total biomass harvest. The value of f_{NRB} value for this first CPA in Ghana so obtained is 99%. GLC can therefore confirm that the fraction of woody biomass used in the absence of the project activity in year y that can be established as non renewable has been calculated correctly and according to the applied methodology.</p> <p>This issue is therefore considered closed out.</p>	<p>OK</p> <p>Closed out</p>

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	<p><u>PP on 11.05.2012</u></p> <p>The CPA-DD has been amended to adopt the approach in the SSC WG SSC WG as published at http://cdm.unfccc.int/Panels/ssc_wg/index.html. (see section B.5.2). To be conservative, we proposed two approaches of calculating the biomass used in the absence of the project activity, and used the lower value from either (1) Based on volumetric wood harvest data and converted to tonnes using the appropriate Biomass Conversion and Expansion Factor for wood removal, and (2) Calculating Total Annual Biomass Removals (Ry) and use it as a proxy for By in line with the SSC WG information note contained in the thirty fifth meeting report annex 20 This approach would yield same values as the SSC WG method, or more conservative values than the SSC WG method; and is applicable in both LDCs and non-LDCs.</p> <p>The fNRB for Ghana using this approach is 0.99</p>		

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<p><u>CPA-CL No. 1 (GLC on 06.02.2012)</u></p> <p>Clarification is requested regarding the source of funds for this CPA.</p>	<p><u>PP on 23.03.2012</u></p> <p>No public funding has been provided for the implementation of the CPA. Funding has been received from the Shell Foundation for the development and implementation of the PoA to which this CPA will be included, but the project participant wishes this to remain confidential. The CME, Envirofit, has confirmed that funding provided by the Shell Foundation has not resulted in the diversion of ODA (see letters provided in Annexes 17 and 18).</p>	<p><u>GLC on 17.04.2012</u></p> <p>Implementation of the CPA has been assisted by grant funding donated by Shell Foundation^{/23/} (through its Breathing Space Programme) to take care of the initial cost of designing the stoves and to register the PoA while stressing that “<i>The grant finance provided by Shell Foundation is suitable to establish a pilot manufacturing and dissemination activity in the initial years before carbon finance can become an adequate revenue source.</i>” Also according to an ODA Declaration by Shell Foundation^{/36/} „Shell Foundation is providing financial support for the development and implementation of the „Improved Cooking Stoves Programme of Activities in Africa“ clean development mechanism programme of activities and hereby confirms that funding for this development is not a diversion of official development assistance from any Annex I country.“ This issue is therefore considered closed out.</p>	<p>OK Closed out</p>
<p><u>CPA-CL No. 2 (GLC on 06.02.2012)</u></p> <p>Onsite visit revealed that there has been some degree of</p>	<p><u>PP on 23.03.2012</u></p> <p>The CPA will replace both conventional and improved</p>	<p><u>GLC on 17.04.2012</u></p> <p>During the on-site audit for this first CPA, conducted</p>	

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<p>penetration of ICS in Ghana. Different varieties of stoves were found in the households of potential end users. Some with efficiencies comparable to three-stones while others were very low efficient ICS. Given that many of the end users would also wish to replace their stoves with Envirofit stoves, 0.1 or 10% does not seem appropriate and does require some clarifications.</p>	<p>cookstoves. There is no way of accurately measuring the efficiency of the improved charcoal stoves that are currently available on the market since there are different varieties of these and the quality of components and workmanship involved in manufacturing varies widely. However, the default value of 0.2 for improved stoves from the methodology AMS II G v3 can be applied. The average rate of penetration of such improved stoves then needs to be determined.</p> <p>There are no official Ghanaian Government statistics on the penetration of “improved” cook stoves. The available literature suggests that the distribution of improved stoves in Ghana has been limited to date, and patchy at best, with the following observations:</p> <ol style="list-style-type: none"> 1. The Ahibenso stove, which was first introduced in the 1990s with Government support, is now basically unavailable in the marketplace due to a) not having been very popular with end users and b) lack of momentum once funding ran out. It can thus be assumed that there is no penetration of this stove. The estimated efficiency 	<p>from January 25 to January 28, 2012 GLC audit team interviewed 24 would-be end users of ICS (randomly and unarranged) in order to validate the baseline stove and/or efficiency of the system being replaced. It was discovered that the population in the Ghana (Kumasi) CPA use a wide variety of stoves – some conventional and some kinds of ICS and still some between conventional and ICS. This is also confirmed by the GTZ April 2008 report on Charcoal in Africa: Importance, Problems and Possible Solution Strategies^{21/} which states “Most households use traditional stoves, which are cheap (from 1.5 to 2 US\$ up) and can be afforded even by poorer households. Examples are traditional stoves from Ghana, Kenya, Madagascar and Uganda. Usually they are made of metal without insulation, which allows most of the heat to escape. Although these stoves are slightly more efficient (10 – 25 %) than the three stone fire using wood, their use wastes a lot of charcoal... Traditional charcoal stoves are very common in African cities, used by up to 80 % of the households”.</p> <p>According to Low Carbon Africa-Ghana^{49/} “There is a</p>	<p>OK Closed out</p>

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	<p>improvement of the stove was in the order of 30-40% over the traditional coal-pot (hence a thermal efficiency of around 0.13-0.14 compared with the default efficiency of 0.1 for the conventional metal coal pot)</p> <p>2. The Gyapa stove, which first introduced by Enterprise Works in 2002, is more popular and is available in markets. However, it is unclear what proportion of the population uses the stoves (numbers cited in the literature are in the order of 150,000-200,000 stoves sold by 2006). The thermal efficiency of Gyapas varies widely due to the lack of quality control over local manufacturing, but is estimated at being up to 50% more efficient than a traditional coal pot (0.15 efficiency).</p> <p>3. The Toyola stove, which is essentially a more recent (started in 2006) re-branded version of the Gyapa has been sold in numbers in the order of 150,000 since its introduction. Toyolas have a similar thermal</p>	<p><i>huge opportunity for the improved cookstoves projects to be replicated and scaled-up. This is because only 23 per cent of the potential charcoal cookstoves market has been reached, not to mention the equally huge improved firewood cookstoves market that remains practically unserved."</i></p> <p>Also, according to Ghana Demographic and Health Survey "The GDHS 2008 results indicate that all (100 percent) households that use solid fuel for cooking do so without a chimney or hood, and there is no marked difference between urban and rural areas. A closed fire or stove with a chimney is used by less than 1 percent of households in Ghana."</p> <p>Similarly, According to WHO-UNDP⁵¹ „Access to improved cooking stoves is also very limited. In LDCs and SSA, only 7 percent of people who rely on solid fuels use improved cooking stoves to help reduce indoor smoke.“.</p> <p>This statistics do confirm the information presented by PP. The weighted average efficiency of 0.101 or 10.1% of the system being replaced is appropriate, representative and conservative. This issue is</p>	

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	<p>efficiency to the Gyapa (since it is essentially the same stove).</p> <p>4. UNDP/WHO (2009) estimates a penetration of ICS of 0.2% nationally in Ghana (slightly higher at 0.3% in urban areas), citing 2008 data on <u>access</u> to ICS (rather than actual usage, which could be much lower).</p> <p>Even if it were conservatively be assumed that a penetration of ICS of 1% had been achieved across the whole of Ghana, this would result in a baseline efficiency of just 0.101 as shown below. Thus the CPA-DD has been amended and the baseline efficiency is set at 0.101 in the emissions reduction calculations and full information on the assumptions applied has been provided in proof 3.</p> <table><tr><th>Stove</th><th>penetration</th><th>n_{NEW}</th></tr><tr><td>ICS</td><td>1%</td><td>0.2</td></tr><tr><td>conventional</td><td>99%</td><td>0.1</td></tr><tr><td colspan="2">weighted average efficiency</td><td>0.101</td></tr></table>	Stove	penetration	n _{NEW}	ICS	1%	0.2	conventional	99%	0.1	weighted average efficiency		0.101	therefore considered closed out.	
Stove	penetration	n _{NEW}													
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	<p>Sources:</p> <ul style="list-style-type: none"> ➤ Low-carbon Africa:Ghana; Ishmael Edjekumhene and Jacqueline C Cobson-Cobbold, KITE, November 2011, p5 ➤ A review of trends, policies and plans for increasing energy access in Ghana; Kemausuor F, et al. A review of trends, policies and plans for increasing energy access in Ghana. Renew Sustain Energy Rev (2011), doi:10.1016/j.rser.2011.07.041, p4 ➤ Legros, G., Havet, I., Bruce, N. and Bonjour, S., The Energy Access Situation in Developing Countries; A review focusing on the least developing countries and Sub-Saharan Africa. UNDP/WHO. New York, 2009, p91. 		
<p><u>CPA-CL No. 3 (GLC on 06.02.2012)</u></p> <p>Clarification is requested as to why the efficiency of the</p>	<p><u>PP on 23.03.2012</u></p> <p>The efficiency of the deployed system has been</p>	<p><u>GLC on 17.04.2012</u></p> <p>CPA-DD has been revised accordingly to include the</p>	<p>OK</p>

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system being deployed has not been included in section E.6.3 of PoA-DD.	added in to both the PoA-DD in Section E.6.3 and in the CPA-DD in section B.5.1.	efficiency of the system being deployed in the CPA-DD in section B.5.1. This issue is therefore considered closed out.	Closed out
<u>CPA-CL No. 4 (GLC on 06.02.2012)</u> The parameter SOF is not explicitly mentioned in the applied methodology. Clarification is required from PP concerning the parameter and the appropriateness of the value of 1 indicated in the CPA-DD	<u>PP on 23.03.2012</u> The parameter SOF is required in order to apply the requirements in paragraph 16 of the SSC methodology AMS II G v3: <i>Monitoring shall also consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to determine if they are still operating or are replaced by an equivalent in service appliance.</i> The CPA-DD has been amended to clarify that in order to apply this requirement, the CME will select a sample of stoves from the PoA_Distribution and Monitoring Database as part of the PoA Sampling plan, and will visit the households which received these stoves. SOF will be checked by visual inspection and interview with the stove owner or household representative.	<u>GLC on 17.04.2012</u> Considering that the value of 1 applied in the CPA-DD for GSC meant that all stoves distributed shall remain operational throughout was not only unrealistic but also not conservative, the DOE can confirm, based on sectoral expertise, that 0.95 or 95% operation and 5 % drop off rate is more realistic and also would lead to a conservative estimation of ex-ante emission reduction. The monitoring approached adopted by the PP for this parameter is also considered by GLC to be appropriate and practicable for these kind of projects. The CPA-DD has been revised accordingly and the issue is therefore considered closed out.	OK Closed out

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	<p>It is not possible to know what the real value of SOF could be in advance of distributing stoves and conducting monitoring. Two recently registered cook stove PoAs (in Bangladesh and Nigeria) use values of 1.0 and 0.95 respectively. As the former involves the installation of bricked-in stoves, we feel that the value applied in the latter is more applicable to this PoA. Therefore, a value of 0.95 has been chosen for the purposes of ex-ante emissions reduction calculations.</p> <p>This assumes that 5% of all stoves distributed will either not be found or will no longer be in use when monitored. This is seen as conservative because:</p> <p><i>B</i> Initially, SOF could be expected to be very low (close to zero) as the customer has paid a relatively high price for the stove compared with the existing alternative, and expects to get a return on this through fuel cost savings.</p> <p><i>C</i> Envirofit International Ltd offers a 5-year warranty for its stoves and they have an expected lifetime of 7-10 years. Thus there is no technical reason to think the customer will stop</p>		

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	<p>using their stove in this timeframe.</p> <p><i>D</i> With training of the CPA implementer on correct data collection, the incidence of incorrect data capture leading to not finding stoves will be minimised.</p> <p><i>E</i> With customer follow-ups through the CPA implementer, CEESD and its network of distributors, the CME can ensure that customer data is kept up to date (this is also a condition of the 5-year warranty).</p> <p><i>F</i> In the final years of the crediting period (years 8-10), the SOF value could be expected to decline somewhat, but it is impossible to know in advance how it will differ from the assumed value of 0.95. The real rate of decline of SOF can only be learned during monitoring, and can then be addressed by the CME through improvements to the PoA.</p>		
<p><u>CPA-CL No. 5 (GLC on 06.02.2012)</u></p> <p>The methodology does not prescribe any default value for</p>	<p><u>PP on 23.03.2012</u></p> <p><u>Explanation of approach:</u></p>	<p><u>GLC on 17.04.2012</u></p> <p>PP has designed a sampling plan that considers the</p>	

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<p>"Fuel-wood Consumption due to continuous use of Baseline Stoves" and the value of zero applied by the PP does not have any reference. For ex-ante estimation of ER zero cannot be considered conservative considering that some end users would still be using their old appliances in parallel with the new ones. Clarification is request for the appropriateness of this estimated value of zero</p>	<p>The methodology (para 20) requires that:</p> <p><i>Monitoring shall ensure that:</i></p> <p><i>(a) Either the replaced low efficiency appliances are disposed of and not used within the boundary or within the region; or</i></p> <p><i>(b) If baseline stoves continue to be used, monitoring shall ensure that the fuel-wood consumption of those stoves is excluded from B_{old}.</i></p> <p>In order to meet these requirements, the CME will select a sample of ICS from the PoA Distribution and Monitoring Database as part of the PoA Sampling Plan, and estimate the amount of fuel-wood consumption of those stoves. The CPA-DD (Section B.5.2) has been amended to clarify how this will be done, and further detail of the sampling method is provided in the Sampling Plan in the PoA-DD.</p> <p>In order to monitor continued use of baseline stoves, two parameters will be monitored:</p> <p>μ_{old}: Average amount of woody biomass consumption that is consumed through the continued use of</p>	<p>determination of Fuel-wood Consumption due to continuous use of Baseline Stoves. The approach is considered appropriate by the DOE.</p> <p>Considering that the vale of zero applied in the CPA-DD for GSC meant that no household shall use the old stove upon purchasing the new ICS was not only unrealistic but also not conservative, the value of 5% is confirmed by the DOE, based on local knowledge and sectoral expertise, to be both realistic and conservative in ex-ante estimation of emission reductions.</p> <p>The CPA-DD has been revised accordingly and the issue is therefore considered closed out.</p>	<p>OK</p> <p>Closed out</p>

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	<p>baseline (replaced) stoves (kg/year) (to be established through sampling). The value of μ_{old} will be estimated by comparing the number of meals per month before and after ICS receipt, and multiplying this proportion against the total annual biomass consumption. Thus,</p> $\mu_{old} = \frac{MPM_{after\ ICS}}{MPM_{before\ ICS}} \cdot \text{Total annual fuel consumption (kg)}$ <p>The Sampling Plan in Section E.7.2 of the PoA-DD outlines the approach to be taken for sampling of this parameter. There are two options available to the CME for monitoring this parameter:</p> <p>Option A involves monitoring the amount of fuel consumption using baseline (replaced) stoves in each monitoring period by interviewing a sample of ICS users and calculating the average value (kg).</p> <p>Option B involves monitoring the amount of fuel consumption using baseline (replaced) stoves at the beginning of the crediting period to establish an average value for μ_{old} and fixing this amount for one</p>		

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	<p>or more subsequent monitoring periods. The CME will then monitor the <i>fraction</i> (see below) of end users still using baseline stoves in each monitoring period and apply the average value for the <i>amount</i> of fuel-wood consumption already established at the beginning. The value for the amount could also be updated (say after the first 5 years of the crediting period).</p> <p>f_{old}: Fraction of end users that are still using their replaced stoves during the monitoring period (established through sampling).</p> <p>During sampling, there are two options for the CME to choose from to estimate this value:</p> <p>Option A: estimating f_{old} by visiting a sample of end users to establish the fraction that are continuing to use baseline stoves.</p> <p>Option B: estimating f_{old} by visiting a sample of end users to establish the fraction that are <i>not</i> continuing to use baseline stoves.</p> <p>Where,</p>		

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	<p>$f_{old} = (1 - f_{non,old})$</p> <p>This parameter in Option B is thus referred to as $f_{non,old}$ and the reasons for retaining this flexibility is explained in detail in the PoA Sampling Plan in Section E.7.2 of the PoA DD. The explanation is that in some circumstances the CME would face prohibitive costs because it would have to sample such a large number of ICS end users whenever it expects the value of fold to be very low (e.g. an expected value of 10% or lower could lead to an estimated required sample size of around 1000 end users). However, if the CME can instead sample $f_{non,old}$ and expects this range to be relatively high (say 90%) then it becomes much more cost-effective because a relatively small sample is adequate (e.g. for an expected range of 0.8 to 1.0 for $f_{non,old}$ the required sample size is around 100).</p> <p>It must be remembered, that even if the CME gets the expected value of this parameter wrong ex-ante, it will have no impact on the emissions reductions that are</p>		

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	<p>calculated or claimed as a result of monitoring. The result will simply be that it must continue sampling until it achieves the required reliability level. It makes no difference to the reliability of the estimated parameter whether Option A or Option B is applied. The issue is simply that when estimating the required sample size ex-ante, if the expected value of the parameter is close to zero the estimated sample size will be very large and the CME will be forced to conduct this many samples. The issue arises due to the requirement of the PoA Sampling Standard (EB 65) for precision to be relative (rather than absolute).</p> <p><u>Values assumed for ex-ante emissions reduction calculations:</u></p> <p>As the values of u_{old} and f_{old} cannot be known in advance, assumptions must be made. The Tables for these parameters in the monitoring plan of the CPA-DD have been amended to clarify the assumptions made.</p> <p>For u_{old}, a scenario-based approach has been used to estimate the proportion of woody biomass consumed using baseline stoves. The scenario values</p>		

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	<p>range from 1.1-33% of total consumption depending on whether the end user uses the baseline stove as follows:</p> <p>low frequency (one meal per month = $1/90 = 1.1\%$), medium frequency (one meal per week = $4/90 = 4.4\%$); or high frequency (one meal per day = 33%). For ex-ante estimation purposes, the medium scenario is seen as most appropriate. To be conservative, we have rounded up the medium scenario percentage to 5% of total annual fuelwood consumption, which is equal to 217.8kg.</p> <p>For f_{old} it has been assumed that 10% of end users will continue to use baseline stoves. (thus, $f_{non,old} = 0.9$). There is no way of knowing whether this value is correct or not, as it can only be determined during monitoring. However, this value seems reasonable based on the consumer's level of understanding of the relationship between the use of the ICS and the fuel cost savings they can expect (see additional Annex 16 for example). It must be remembered that if during monitoring the CME finds that the value of f_{old} is actually higher or lower than the assumed value,</p>		

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	<p>then it will have to keep sampling until it achieves the required reliability level, and that it will apply the actual values estimated through sampling for emissions reduction calculations. The CME can then adjust its assumptions for future CPAs as well as make changes to the distribution plan to address this type of issue.</p>		
<p><u>CPA-CL No. 6 (GLC on 06.02.2012)</u></p> <p>CME has indicated that EIA shall be conducted at PoA level. However, considering that CPAs under the PoA shall be implemented in different countries with different regulations and/laws on the environment, more explanation is required why EIA shall not be conducted at CPA level</p>	<p><u>PP on 23.03.2012</u></p> <p>The CPA-DD has been amended such that it is now consistent with the new approach in the PoA-DD. The environmental analysis is undertaken at the CPA level for the first CPA in each country in the PoA. If required by the host country government, an Environmental Impact Assessment (EIA) would be done for the first CPA in each country, or alternatively an exemption would be obtained if required. In the case of Ghana, there is no requirement to conduct an EIA. An email communication between the EPA and the CPA implementer has been provided (see additional Annex 12), as has a scan of the registration with the Ghana Standards Board (see additional Annex 13). The EIA exemption certificate is expected</p>	<p><u>GLC on 17.04.2012</u></p> <p>The CPA-DD has been revised accordingly. For this CPA in Ghana, in a reply to an email sent by CEESD to Environmental Protection Agency of Ghana, Mr Kyekyeku Yaw Oppong-Boadi wrote „As per the e-mail sent to you the EPA has studied your PIN and the PoA and you are advised that the nature of your undertaking does not require the preparation of EIA“. This issue is therefore considered closed out</p>	<p>OK Closed out</p>

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	in the near future and will be provided to the DOE once received.		
<u>CPA-CL No. 7 (GLC on 17.04.2012)</u> The expected operational lifetime of the SSC-CPA has been indicated as 21 years. However, ICS lifetime is clearly shorted than 21 years. It is therefore not logical how the PoA can last for 21 years.	<u>PP on 23.03.2012</u> The CPA-DD has been amended such that in Section A.4.2.2 it now indicates that the expected operational lifetime of the CPA is 10 years (fixed crediting period). The manufacturer of the ICS to be distributed under the proposed CPA, Envirofit International Ltd , has undertaken rigorous testing of the stoves both in the laboratory and the field and estimates that with an appropriate education and monitoring process the expected life of the current stove line should be in the range of 7-10 years. A letter stating this has been provided to the DOE from the manufacturer (see additional Proof 12). The ER calculations table in B.5.3 has been updated accordingly to reflect the change to a single 10 year crediting period.	<u>GLC on 16.04.2012</u> According to a statement from Envirofit International Ltd dated March 01, 2012 “Envirofit products have great performance and are designed to be durable. Envirofit warranties the stove combustion chamber for 5 years of life. This does not however represent the target design life of the stove, only the warranty period. With an appropriate education and monitoring process the expected life should be in the range of 7 - 10 years.” GLC can confirm, based on physical inspection of the stoves, that 7 – 10 years is reasonable. The CPA lifetime of 10 years is therefore appropriate and the issue is considered closed out.	OK Closed out
<u>CPA-CL No. 8 (GLC on 17.04.2012)</u>	<u>PP on 11.05.2012</u>	<u>GLC on 13.06.2012</u>	OK

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<p>Clarification is requested concerning the sources of the leakage and project emissions presented in the first CPA-DD and its corresponding ER calculation sheet and how these emission have been been calculated.</p>	<p>The emissions reductions calculations as presented in the CPA-DD have been revised in line with the approach required by the methodology AMS II.G. As a result, there are no leakage emissions or project emissions to be calculated, since these are already incorporated into the emissions reductions calculations using the approach and leakage default factors from the methodology as described in section B.5.2 of the CPA-DD. The Emissions Reduction table in Section B.5.3 has been amended accordingly as has the corresponding ER calculation spread sheet.</p>	<p>There are no direct leakage emissions as per the applied methodology. As such the presentation of the emission reduction calculation has been revised to be in line with the applied methodology.</p> <p>The presentation in the CPA-DD has been revised as well.</p> <p>This issue is therefore considered closed out.</p>	<p>Closed out</p>
<p><u>CPA-CL No. 9 (GLC on 17.04.2012)</u></p> <p>PP is requested to mention and justify any changes from the CPA-DD for GSC to the final CPA-DD which were not triggered by any request from the validation team.</p>	<p><u>PP on 05.06.2012</u></p> <p>While addressing the findings raised by the DOE during the validation, a number of additional minor changes were made to the text of the CPA-DD which were not directly triggered by the CARs and CLs. These were typically of the following type:</p> <ul style="list-style-type: none"> • Minor edits of text to improve consistency, clarity of meaning and readability without changing content • Additional information provided to strengthen existing arguments (e.g. new text added to 	<p><u>GLC on 13.06.2012</u></p> <p>GLC can confirm that PP has undertaken some editings of some portion of text which were not directly triggered by any findings. However, these editings have got no impact on the project design. Any other editing has been addressed and tracked by a finding.</p> <p>This issue is therefore closed out</p>	<p>OK</p> <p>Closed out</p>

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	<p>page 5-6 to describe how the Envirofit stoves achieve higher efficiencies compared with the baseline stoves, going into more detail than in the GSC version)</p> <ul style="list-style-type: none"> Changes made as a result of the unsolicited changes made to the PoA-DD to ensure consistency (e.g. Parameter Stove_{year} added to the monitoring plan). <p>Two more significant changes were made, namely:</p> <ul style="list-style-type: none"> The new stove model CH2300 was added to the CPA-DD following the GSC version. This stove is a modified version of the CH2200 stove, with the flat pot support (ring) removed to better suit round-bottomed stoves which are preferred by the local people in Ghana. This modification was based on user feedback. Details of the stove design, its efficiency and the certification sheet have been included. The list of data that is to be recorded by the DO during distribution was amended. Firstly, the CPA ID number will not be recorded by the DO when distributing stoves, but rather, 		

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	<p>a list of all stoves will be maintained by the CME and assigned to CPAs in the Database. This will help avoid incorrect assignment of stoves to CPAs due to human error. Secondly, the fuel type of the old stove being replaced will only be recorded, not the efficiency, since this is already factored into the baseline n_{new} contains a weighted average of the default values for improved vs conventional). Thirdly, Two items were added: the model of the ICS being distributed and the Distributor ID number. These changes improve the CME's control over the data to be collected.</p>		

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Table 3: Assessment of CPA compliance against Eligibility Criteria for Inclusion

#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
1	Boundary and Location of the CPA: <i>The geographical boundary of the CPA including any time-induced boundary shall be consistent with the geographical boundary set in the PoA.</i>	<p>The CPA boundary is limited to Ghana, a country which is within the PoA boundary as listed in section A.4.1.1 of the PoA-DD.</p> <p>The CPA boundary is specified in CPA-DD.</p>	Based on on-site visit GLC confirms that CPA 1 is within the PoA boundary and that no time-induced boundary is expected.	<input checked="" type="checkbox"/>
2	Avoiding Double Counting: <i>Conditions that avoid double counting of emission reductions like unique IDs of product and end-user locations (e.g. programme logo), and avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA, as well as internal double counting within all CPAs of this PoA.</i>	<p>The ICSs to be distributed in this CPA each have a unique serial ID number, as indicated in figure 5 in the CPA-DD.</p> <p>The Database developed by the CME clearly shows how customer data will be linked to Stove ID numbers.</p>	<p>GLC has seen samples of ICSs with serial numbers during the on-site assessment. Also samples of CER waiver forms^{/60/} (Distribution Record or sales receipt) presented during the site visit captures customers' details such as addresses and phone numbers.</p> <p>Furthermore, the end user keeps a copy of the Distribution Record or sales receipt^{/60/} (white copy) while the pink and yellow copies are retained by the DO and CME respectively. This distribution record indicates, among others, the end user's name and address, ICS model, serial number, date when ICS was sold. This receipt also serves as a CER waiver agreement between end user and CME. GLC can therefore confirm that the management plan is sufficient to avoid double counting of stoves in this PoA or in another PoA. This arrangement is considered by GLC as sound and even without additional measures will prevent internal double counting between CPAs or PoAs managed by the CME.</p> <p>Further measures taken to avoid double counting (to avoid</p>	<input checked="" type="checkbox"/>

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#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
			the scenario whereby stoves belonging to this CPA is intentionally included and counted in another CPA of another PoA) include, in addition to the CME logo which is found on all stoves manufactured by Envirofit International Ltd. each CPA implementer (DO) shall also be expected to identify all subsequent ICSs deployed by them in all subsequent CPAs with a programme logo. The database implemented by the CME, which was presented to the audit team, also includes the contact details of every end user of ICS under the CPA.	
3	Applicability of Methodology AMS-II.G - Technology Type: <i>Specifications of technology/measure including level and type of service, performance specifications including compliance with testing/certifications.</i>	The ICS uses one of the following fuel types: <ul style="list-style-type: none"> • Wood fuel • Charcoal 	Manufacturer's specifications provided to GLC which is also available at www.envirofit.org indicate that the models to be distributed in this CPA (CH2200 , CH2300 and CH4400) are charcoal stoves. This was also confirmed during the on-site visit.	<input checked="" type="checkbox"/>
4	Applicability of Methodology AMS-II.G – Minimum ICS Efficiency: <i>Specifications of technology/measure including level and type of service, performance specifications including compliance with testing/certifications.</i>	The ICS has a minimum efficiency of 20% as specified in AMS II.G, Version 3, para 1.	The three stove models to be deployed in this CPA are CH 2200 with an average thermal efficiency of 38.2% ^[56/] , CH 2300 with an average thermal efficiency of 39.4% ^[54/] and CH 4400 with an average thermal efficiency of 31.4% ^[57/] , measured according to Emission and Performance Test Protocol ^[13/] by Colorado State University. A value of 36.3% has been applied as the 'efficiency of the system being deployed' in estimating the emission reduction based on an equal deployment of all three models [(38.2+39.4+31.4)/3=36.3%]. Actual emission reduction shall be calculated using weighted average ICS efficiency based on actual distribution of both CH 2200 , CH 2300 and CH	<input checked="" type="checkbox"/>

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#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
			4400. Test certificates have been provided to GLC ^{/54/ /56/ /57/} .	
5	Start date of CPA: <i>Conditions to check the CPA start date through documentary evidence and that CPA start date shall not be before GSC of PoA.</i>	The start date of the CPA is 03 January 2012 as indicated in the CPA-DD. This has been defined as the date of shipment of the contingent of stoves from China port.	The Bill of Lading has been received and checked ^{/41/} . GLC can confirm that the start date of the first CPA indicated as 03/01/2012 corresponds to the date of shipping of a contingent of ICS from China. The start date is therefore reasonably defined as the date of real action as per CDM glossary of term. The CPA start date 03/01/2012 is after the start of GSC of PoA on 13/12/2011.	<input checked="" type="checkbox"/>
6	Applicability of the methodology AMS-II.G - Non-renewable biomass in use since Dec 1989: <i>Conditions that ensure compliance with applicability and other requirements of single or multiple methodology/ies and tools applied by CPAs</i>	The first CPA in each country will demonstrate that non-renewable biomass has been in use in the country since December 1989.	According to Trends in removals of wood products 1990-2005 ^{/14/} which states “ <i>Change in Forest Cover: Between 1990 and 2010, Ghana lost an average of 125,400 ha or 1.68% per year. In total, between 1990 and 2010, Ghana lost 33.7% of its forest cover or around 2,508,000 ha.</i> ” It is also indicated in FAO’s Ghana Global Forest Resources Assessment 2010 ^{/15/} that in 1989 14 800 500 m³ (over bark) of fuelwood were harvested. Similarly, according to TED Case Study – Ghana Forest Loss ^{/35/} “ <i>Since 1981, the annual rate of deforestation in Ghana has been two percent/year or 750 hectares each year. Ghana’s tropical forest area is now just 25 percent of its original size.</i> ” This means woody biomass has been in use since December 1989. Furthermore, according to the Study of the Social and Poverty Impacts of Energy Interventions on Rural Communities in Ghana ^{/25/} “ <i>The time spent in collecting wood fuel for cooking, however, is significant and is done primarily by women and children. This human resource spent on</i>	<input checked="" type="checkbox"/>

Validation Report:

African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)

GLC Report No. 223-CPA1, Rev. 11



#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
			<i>meeting energy needs is part of the cycle of poverty</i>	
7	Additionality of CPAs: <i>Conditions that ensure that CPAs to be included under the PoA meet the requirements pertaining to the demonstration of additionality</i>	<p>According to test 1 for micro-scale CPAs, the CPA size (total energy savings) is below 60 GWh_{th}/year and the project activity is an emission reduction activity with both conditions (b) (i) and (ii) satisfied.</p> <p>Also if the CPA size is between 60 and 180 GWh_{th}/year:</p> <p>(a) End users of the subsystems or measures are households /communities/SMEs; and</p> <p>(b) Each of the independent subsystems/ measures in the project activity achieves an estimated annual emission reduction equal to or less than 9 GWh_{th}/year.</p>	<p>The adopted EB 63, Annex 23 “Guidelines for demonstrating additionality of microscale project activities” (version 03) ^{9/} has been applied to this CPA since</p> <ul style="list-style-type: none"> ➤ it aims to achieve energy savings at a scale of no more than 20 gigawatt hours per year (equivalent to 60 gigawatt hours thermal per year). Based on the energy saving calculations included in the calculation file ER-African Improved Cooking Stoves PoA_CPA1 Ghana ver3.2^{11/}, energy savings per ICS is about 13 MWh_{th}/year. Considering that 4 500 ICS would be operational per year in the micro-scale CPA, this corresponds to 59 GWh_{th}/year of energy savings per CPA. This is below the 60 GWh_{th}/year threshold. ➤ each of the independent subsystems or measures (ICS) in the CPA will achieve an estimated annual energy savings equal to or less than 600 megawatt hours (equivalent to 1.8 gigawatt hours thermal per year). In this case the end users of the subsystems or measures are households or communities or small and medium size enterprises (SMEs). Based on the energy saving calculations included in the calculation file ER-African Improved Cooking Stoves PoA_CPA1 Ghana ver3.2^{11/}, energy savings per ICS is about 13 MWh_{th}/year, which far below the 1.8 GWh_{th}/year threshold. ➤ For this CPA each ICS would save about 13 MWh_{th}/year 	☒

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African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)

GLC Report No. 223-CPA1, Rev. 11



#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
			which is far less than 5% of the small scale or micro scale threshold as indicated above and users of the technology/measure (the improved cook stoves) are households or communities or Small and Medium Enterprises (SMEs).	
8	Official Development Assistance (ODA): <i>Conditions to provide an affirmation that funding from Annex I parties, if any, do not result in a diversion of official development assistance.</i>	The CPA is not receiving any funding from Annex I parties.	The CME has provided a declaration that no ODA is used to fund this CPA Envirofit Letter of no ODA support_ICSPoAA ^{37/} . Also according to an ODA Declaration by Shell Foundation ^{36/} „Shell Foundation is providing financial support for the development and implementation of the „Improved Cooking Stoves Programme of Activities in Africa“ clean development mechanism programme of activities and hereby confirms that funding for his development is not a diversion of official development assistance from any Annex I country.“	<input checked="" type="checkbox"/>
9	End-user Group: <i>Target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)</i>	It has been indicated in the CPA-DD that the targeted end user group for this CPA is households.	Based on interview conducted during the on-site assessment, GLC can confirm that end users of ICSs to be distributed in this CPA shall be households. The contract between the CME www.envirofit.org and DO Centre for Energy, Environment and Sustainable Development indicates that ICS shall be distributed to households. The baseline is the use of non-renewable biomass to meet households' energy needs. This has been cross checked with the GTZ April 2008 report on Charcoal in Africa: Importance, Problems and Possible Solution Strategies ^{21/} which states “Most households use traditional stoves, which are cheap (from 1.5	<input checked="" type="checkbox"/>

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#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
			<i>to 2 US\$ up) and can be afforded even by poorer households. Examples are traditional stoves from Ghana, Kenya, Madagascar and Uganda. Usually they are made of metal without insulation, which allows most of the heat to escape. Although these stoves are slightly more efficient (10 – 25 %) than the three stone fire using wood, their use wastes a lot of charcoal... Traditional charcoal stoves are very common in African cities, used by up to 80 % of the households".</i>	
10	Sampling: <i>Conditions related to sampling requirements for a PoA in accordance with the approved guidelines /standard from the Board pertaining to sampling and surveys.</i>	Sampling will be undertaken as part of the PoA Sampling Plan as described in the PoA-DD and validated by GLC.	<p>PP has developed a 'PoA-wide sampling plan', based on simple random sampling, according to the applied methodology AMS-II.G version 03^{2/} and as per EB 69 Annex 5 & 4 "Guidelines for sampling and surveys for CDM project activities and programme of activities (version 02.0)" and Standard for Sampling and Surveys for CDM Projects Activities and PoAs version 3.0^{35/}, with the requirements of the applied methodology taking precedence.</p> <p>PP shall apply 95/10 confidence/precision whenever sampling across a group of CPAs (i.e sampling at PoA level). This would be for parameters, such as efficiencies of the deployed stoves and stove operational fraction, which are not expected to vary largely across CPAs. GLC can confirm that this is in line with Standard for Sampling and Surveys for CDM Projects Activities and PoAs version 3.0^{35/} which states "when a single sampling plan covering a group of CPAs is undertaken..." apply "...95/10 confidence/precision for the sample size calculation".</p> <p>GLC can confirm that the CME will be able to implement the</p>	<input checked="" type="checkbox"/>

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African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)

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#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
			monitoring/sampling plan and the project emission reductions would be able to be reported ex-post and verified.	
11	SSC Limit for CPAs: <i>Conditions that ensure that CPA in aggregate meets the small-scale or micro-scale threshold criteria and remain within those thresholds throughout the crediting period of the CPA.</i>	<p>The annual energy savings are not beyond the limits of 60 GWh_{th}/year over the entire crediting period as presented in the emissions reduction spreadsheet.</p>	<p>The maximum number of ICS that shall ensure that the SSC limit is maintained through out the crediting period has been indicated in the CPA-DD.</p> <p>The adopted EB 63, Annex 23 “Guidelines for demonstrating additionality of microscale project activities” (version 03) ^{19/} has been applied to this CPA since it aims to achieve energy savings at a scale of no more than 20 gigawatt hours per year (equivalent to 60 gigawatt hours thermal per year). Based on the energy saving calculations included in the calculation file ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2^{11/}, energy savings per ICS is about 13 MWh_{th}/year. Considering that 4 500 ICS would be operational per year in the micro-scale CPA, this corresponds to 59 GWh_{th}/year of energy savings per CPA. This is below the 60 GWh_{th}/year threshold.</p> <p>If actual monitoring shall indicate an emission calculation above the applicable threshold, the emission shall be capped to the estimated maximum emission reductions indicated in the CPA-DD. This is according to § 83 of EB65, Annex 5 (Project Standard) which states “<i>If during its implementation and monitoring the project activity goes beyond the limit of its type in any year of the crediting period, the GHG emission reductions that can be claimed during this particular year shall be capped at the maximum GHG emission reductions estimated in the registered PDD for that year during the crediting period.</i>”</p>	☒
12	Exempted from De-bundling:	The average energy savings of each ICS to	This CPA is exempted from performing de-bundling check as per	☒

Validation Report:

African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)

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#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
	<i>De-bundling criterion for the CPA to be included under the PoA.</i>	be distributed in this CPA is only around 10 MWh _{th} /year or less, which is roughly 0.5% of the 1.8 MWh _{th} threshold. (See emissions reduction calculations spread sheet)	EB 54, Annex 13, par. 10 Guidelines on Assessment of De-bundling for SSC Project Activities ^{/5/} , i.e. considered as being not a de-bundled component of a large scale activity since according to the energy saving calculations in the calculation sheet ER-African Improved Cooking Stoves PoA_CPA1 Ghana_ver3.2 ^{/11/} , energy savings per ICS is about 13 MWh_{th}/year , which far below the 1.8 GWh_{th}/year threshold (equivalent of 600 MWh ^{/9/}).	
13	Contractual Agreement: <i>Provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.</i>	The DO has signed a contractual agreement with the CME to participate in the PoA. This agreement: <ul style="list-style-type: none"> ▪ defines the ownership of the carbon emission reduction rights ▪ covers the DO's distribution and monitoring related responsibilities 	The CME and CPA implementer CEESD have entered into a contractual agreement on 10/02/2012 according to the CONFIDENTIAL_Envirofit_CEESD Final Contract Signed ^{/44/} . The contract does ensure that: <ul style="list-style-type: none"> ➤ The CPA implementer (DO) certifies that the CPA has not been and will not be registered as a single CDM project activity or as a CPA under another PoA under the Clean Development Mechanism of the UNFCCC or any voluntary scheme. ➤ The CPA implementer (DO) is aware that the CPA will be subscribed to this PoA ➤ The CPA implementer (DO) cedes its rights to claim and own emission reductions, under the Clean Development Mechanism of the UNFCCC or any voluntary scheme, to the CME of this PoA. 	<input checked="" type="checkbox"/>
14	Local Stakeholder Consultation: <i>Have Local Stakeholder Consultation prior to inclusion of the CPA been included in the eligibility criteria for inclusion of a CPA under the PoA?</i>	A Local Stakeholder Consultation (LSC) must be conducted prior to inclusion of the CPA in the PoA. If a LSC has already been done at the national level for the first CPA in the country, and the LSC covered the issues	For this first CPA a Local Stakeholder Consultation ^{/24/} was conducted on November 14, 2011 in Accra. In addition to the advert placed in the local Newspaper - The Ghana News Agency , invitation letters were sent to individuals, government officials, NGOs, Artisans and to local organisations. Stakeholders were	<input checked="" type="checkbox"/>

Validation Report:

African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)

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#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
		relevant to this CPA, then the LSC does not need to be done again.	identified as those whose activities directly or indirectly impact the project, and those who were to be impacted by the project activities. The 18 page report ^{24/} includes a full list of participants and photos. A sample text of the invitation sent to individual stakeholders as well as a sample of the published invitation has been included in the report. A manually signed list of over 60 participants has also been provided as part of the LSC Report ^{24/} . The LSC included an introduction of the ICSs and a demonstration on how they are used. The concept of CDM and the additional revenues it generates was also introduced. A full length video of the LSC was also played to the audit team during the site visit.	
15	Environmental Impact Analysis: <i>Have Environmental Impact Analysis requirement of the CPA been included in the eligibility criteria for inclusion of a CPA under the PoA?</i>	An Environmental Analysis must be conducted prior to inclusion of the CPA in the PoA. If the Environmental Analysis has already been done at the national level for the first CPA in the country, and the analysis covered the issues relevant to this CPA, then the analysis does not need to be done again. Similarly, if an exemption has been obtained from a government agency exempting the CME from having to conduct an Environmental Impacts Assessment for the first CPA, then this shall count for all subsequent CPAs.	In a reply to an email sent by CEESD to Environmental Protection Agency of Ghana, Mr Kyekyeku Yaw Oppong -Boadi wrote „As per the e-mail sent to you the EPA has studied your PIN and the PoA and you are advised that the nature of your undertaking does not require the preparation of EIA“. GLC can confirm, based on local knowledge and on sectoral expertise, that the implementation of improved cook stoves does not require the PPs to undertake an Environmental Impact Analysis in Ghana.	<input checked="" type="checkbox"/>
16	CPA crediting period: <i>Have the provisions to ensure that the CPA crediting period does not exceed the PoA end date</i>	The duration of the crediting period of each CPA to be included in the PoA shall not exceed the end date of the registered PoA.	The CPA crediting period has been clearly defined as fixed 10 year crediting period and it will start on 15-12-2012 or the date of	<input checked="" type="checkbox"/>

Validation Report:

African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)

GLC Report No. 223-CPA1, Rev. 11



#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
	<i>been included in the eligibility criteria for inclusion of a CPA under the PoA?</i>		inclusion, whichever is later. The information has been indicated correctly in section A.4.3 of the CPA-DD. Being the first CPA under the PoA it can be confirmed that the end date of the CPA crediting period will not be exceed the PoA end date.	
17	Baseline parameters to be established at CPA level (Calculation/determination of ex-ante country/CPA specific parameters as per the applied methodology)	<p>Each CPA shall demonstrate how the baseline parameters that are to be calculated at the CPA level have been determined, and shall do so applying the following the approaches:</p> <ul style="list-style-type: none"> a) fNRB: as per the approach outlined in detail in Annex 3 or using default values where available/approved by the host country DNA; b) Bold: as per the approach outlined in Section E.6.2, applying Option (a) of paragraph 7 of AMS-II.G v.3, using either historical data or a survey of local usage; c) nold: as per the approach outlined in E.6.2, applying Option 2 of paragraph 6 of AMS-II.G v.3, using either national statistics, literature values or through representative sampling. 	<p>CPA or country specific ex-ante parameter, such as the fraction of non renewable biomass, has been calculated following the approach recommended by the SSC WG.</p> <p>CPA or country specific <i>ex-ante</i> parameter, such as the fraction of non renewable biomass, has been calculated following the approach recommended by the SSC WG. The applied approach resulted in a calculated fNRB value of 99% for Ghana. This is same as the default value for Ghana and the figure is also mentioned in the CookClean Ghana Limited —CPA01 under the CDM PoA Clean Cook Stoves in Sub-Saharan Africa by ClimateCare Limited undergoing validation.</p> <p>Considering that Ghana has seen a certain degree of ICS penetration, a calculated weighted average efficiency of 0.101 or 10.1% of the system being replaced in Ghana presented by the PP and validated by GLC is confirmed to be appropriate, representative and conservative compared to the default value recommended by the methodology and based on the sources of the data quoted by the PP and</p>	☒

Validation Report:

African Improved Cooking Stoves Programme of Activities – CPA No. 00001 (Ghana)

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#	Eligibility Criteria as per PoA-DD	CPA Justification with evidences	Means of Validation	
			Assessment	EC met?
			<p>validated by GLC.</p> <p>The quantity of biomass used in the absence of the CPA in tonnes/year (B_{old}) has been calculated taking into consideration the stove drop-off rate or stove operation fraction, average stove operation year, continuous use of old or 'replaced' stoves and the total number of ICS deployed in the CPA. GLC can confirm that the value of B_{old} of 17 602 tons calculated is conservative and appropriate. The formulas are interpreted in the calculation file ER-African Improved Cooking Stoves PoA _CPA1 Ghana_ver 3.2^{/11/} has been checked and reproduced by GLC.</p>	

Validation Report

GLC Report No. 223-CPA1, Rev. 11



ANNEX B: CERTIFICATES OF COMPETENCE

Validation Report

GLC Report No. 223-CPA1, Rev. 11



Certificate



Name : Mr. Karunakar Avuram (B. Eng.)
Certificate No. : 023

This document certifies that Mr. Karunakar Avuram, citizen of India, is assigned as CDM assessment team leader, validator/verifier and expert by Germanischer Lloyd Certification GmbH.

Mr. Karunakar Avuram fulfils GLC's competence requirements to validate and verify CDM projects within the following sectoral scopes and technical areas.

CDM Sectoral Scope (SS) and Technical Area (TA)	Validity date:
SS 1: Energy Industries (renewable / non-renewable sources)	
TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	
TA 1.2: Energy generation from renewable energy sources	
SS 2: Energy Distribution	
TA 2.1: Electricity distribution	
TA 2.2: Heat distribution	
SS 3: Energy Demand	
TA 3.1: Energy demand	2011-03-14
SS 7: Transport	
TA 7.1: Transport	
SS 10: Fugitive Emissions from Fuels	
TA 10.1: Mining and mineral processes (excluding those included in TA 10.2)	
TA 10.2: Oil and gas industry, coal mine methane recovery and use	
SS 13: Waste Handling and Disposal	
TA 13.1: Waste handling and disposal	
TA 13.2: Animal waste management	

Hamburg

2012-03-19
Date

GLC Management

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Validation Report

GLC Report No. 223-CPA1, Rev. 11



Certificate



Name : Mr. Fernando Villasana
Certificate No. : 052

This document certifies that Mr. Fernando Villasana is assigned as CDM validator/verifier and reviewer by Germanischer Lloyd Certification GmbH.

Mr. Fernando Villasana fulfils GLC's competence requirements to validate and verify CDM projects within the following sectoral scopes and technical areas.

CDM Sectoral Scope (SS) and Technical Area (TA)	Validity date:
SS 1: Energy Industries (renewable / non-renewable sources)	
TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	
TA 1.2: Energy generation from renewable energy sources	
SS 2: Energy Distribution	
TA 2.1: Electricity distribution	
TA 2.2: Heat distribution	
SS 3: Energy Demand	
TA 3.1: Energy demand	
SS 4: Manufacturing industries	
TA 4.1: Cement sector	
TA 4.2: Aluminium	
TA 4.3: Iron and steel	
TA 4.4: Refinery	
SS 5: Chemical industry	
TA 5.1: Chemical process industries	
SS 7: Transport	
TA 7.1: Transport	
SS 8: Mining/mineral production	
TA 8.1: Mining and mineral processes, excluding those included in TA 8.2 below	
TA 8.2: Oil and gas industry, coal mine methane recovery and use	
SS 10: Fugitive Emissions from Fuels	
TA 10.1: Mining and mineral processes (excluding those included in TA 10.2)	
TA 10.2: Oil and gas industry, coal mine methane recovery and use	
SS 13: Waste Handling and Disposal	
TA 13.1: Waste handling and disposal	
TA 13.2: Animal waste management	
SS 15: Agriculture	
TA 15.1: Agriculture	
TA 15.2: Animal waste management	

Hamburg

2012-07-26

Date

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Validation Report

GLC Report No. 223-CPA1, Rev. 11



Certificate



Name : Mr. Georg Zenk
Certificate No. : 56

This document certifies that Georg Zenk, citizen of Germany with experience in Uganda, is assigned as CDM expert by Germanischer Lloyd Certification GmbH.

Mr. Georg Zenk fulfils GLC's competence requirements to validate and verify CDM projects within the following sectoral scopes and technical areas.

CDM Sectoral Scope (SS) and Technical Area (TA)	Validity date:
SS 1: Energy Industries (renewable / non-renewable sources)	
TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	
TA 1.2: Energy generation from renewable energy sources	
SS 2: Energy Distribution	
TA 2.1: Electricity distribution	
TA 2.2: Heat distribution	
SS 3: Energy Demand	
TA 3.1: Energy demand	2012-02-06
SS 7: Transport	
TA 7.1: Transport	
SS 10: Fugitive Emissions from Fuels	
TA 10.1: Mining and mineral processes (excluding those included in TA 10.2)	
TA 10.2: Oil and gas industry, coal mine methane recovery and use	
SS 13: Waste Handling and Disposal	
TA 13.1: Waste handling and disposal	
TA 13.2: Animal waste management	

Hamburg

2012-02-06

Date

GLC Management

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Validation Report

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Certificate



Name : Mr. Markus Weber (Dipl.)
Certificate No. : 001

This document certifies that Mr. Markus Weber, citizen of Germany, is assigned as CDM assessment team leader, validator/verifier and expert by Germanischer Lloyd Certification GmbH.

Mr. Markus Weber fulfils GLC's competence requirements to validate and verify CDM projects within the following sectoral scopes and technical areas.

CDM Sectoral Scope (SS) and Technical Area (TA)	Validity date:
SS 1: Energy Industries (renewable / non-renewable sources)	
TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	
TA 1.2: Energy generation from renewable energy sources	2011-09-09
SS 2: Energy Distribution	
TA 2.1: Electricity distribution	
TA 2.2: Heat distribution	
SS 3: Energy Demand	
TA 3.1: Energy demand	
SS 7: Transport	
TA 7.1: Transport	
SS 10: Fugitive Emissions from Fuels	
TA 10.1: Mining and mineral processes (excluding those included in TA 10.2)	
TA 10.2: Oil and gas industry, coal mine methane recovery and use	
SS 13: Waste Handling and Disposal	
TA 13.1: Waste handling and disposal	2008-12-15
TA 13.2: Animal waste management	

Hamburg

2011-09-09

Date


GLC Management

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